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CONTENTS.

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

AN ADDRESS on the Relationship of Uræmia and Hyperpiesia. By H. BATTY SHAW, M.D., F.R.C.P.—*(Illustrated)*. 1307

ORIGINAL ARTICLES.

Serological and Morphological Characteristics of the Pneumococcus. By A. L. URQUHART, *O.B.E.*, M.B., Ch.B., D.P.H.... 1313

The Importance of Thoracic Respiration. By Sir W. ARBUTHNOT LANE, M.S., F.R.C.S.—*(Illustrated)*..... 1317

The Rationale of the Wassermann Reaction. By J. E. R. MCDONAGH, F.R.C.S. 1319

The Sachs-Georgi Reaction in Syphilis. By JAMES LAW BROWNLIE, M.D., D.P.H..... 1322

Tumour of the Right Petrous Bone. By THOMAS ANWYL-DAVIES, M.B., B.S., M.R.C.S. .. 1323

Plague on Board Ship. By Lieut.-Colonel W. W. CLEMESHA, C.I.E., M.D., D.P.H. 1338

MEDICAL SOCIETIES.

Society of Medical Officers of Health: Development of Hygiene, Pathology, and Bacteriology in the Naval Medical Service 1324

South-West London Medical Society: Syphilis 1324

London Association of the Medical Women's Federation: Sterility.. 1325

Liverpool Medical Institution: Encephalitis Lethargica..... 1326

Leeds and West Riding Medico-Chirurgical Society: Oral Sepsis and Systemic Disease.. 1326

REVIEWS AND NOTICES OF BOOKS.

Studies in the Palæopathology of Egypt. By Sir Marc Armand Ruffer, C.M.G., M.D. Edited by Roy L. Moodie, Ph.D. 1327

Comment Interpréter en Clinique les Réponses du Laboratoire? Par Hugel, Delater, and Zoeller... 1327

Hygiene of Women and Children. By Janet E. Lane-Claypon, M.D., D.Sc. 1327

Principles and Practice of Surgery. By Dr. A. Herman Haubold 1328

Practical Physiological Chemistry. Third edition. By J. A. Milroy, M.A., M.D., and T. H. Milroy, M.D., B.Sc., F.R.S.E... 1328

Dictionnaire de Biologie Physiciste. By Albert and Alexandre Mary.. 1328

Some Micro-Chemical Tests for Alkaloids. By Charles H. Stephenson and C. E. Parker..... 1329

Technique of the Teat and Capillary Glass Tube. Second edition. By Sir Almroth E. Wright, M.D., F.R.S., and Leonard Colebrook, M.B., B.S. 1329

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Erblichkeitslehre und Rassenhygiene. Band I. Menschliche Erblichkeitslehre. By Prof. Erwin Baur, Prof. Eugen Fischer, and Dr. Fritz Lenz 1329

Physical Signs in the Chest and Abdomen. By A. J. Jex-Blake, M.A., M.D., F.R.C.P. 1330

Archivio di Patologia e Clinica Medica..... 1330

NEW INVENTIONS.

Tendon Tunnelling Forceps (F. Wilson Stuart, M.Ch.)—*(Illustrated)* .. 1330

LEADING ARTICLES.

THE INTERNATIONAL STANDARDISATION OF SERA 1331

THE DULL AND BACKWARD CHILD 1331

PUBLIC HEALTH IN EGYPT 1332

ANNOTATIONS.

Russian Famine Relief... 1333

Benjamin Marten, Pioneer 1333

The Eradication of Tuberculosis in Cattle..... 1334

Serum-Globulin and the Wassermann Test..... 1334

Arthritis Deformans of the Hip 1334

Veterinary Health Service in France 1335

Blood Transfusion for Burn Shock 1335

Sexual Reform..... 1336

Vincent's Disease 1336

Moths as Pests in the Pharmacy 1336

Artificial Pneumorachis in Meningeal Infections... 1337

Dental Registration..... 1337

SPECIAL ARTICLES.

The International Standardisation of Sera: An Important Conference. 1339

King Edward's Hospital Fund for London 1340

Roumania: Sterile Marriages and Examination of Spermal Fluid..... 1343

PUBLIC HEALTH SERVICES.

Reports of Medical Officers of Health..... 1344

Vital Statistics of London During November, 1921 1344

Analysis of Sickness and Mortality Statistics in London During November, 1921 1345

THE SERVICES.

Royal Naval Medical Service.—Royal Army Medical Corps.—Royal Air Force.—India and the Indian Medical Service 1345

OBITUARY.

John Harley, M.D., F.R.C.P. 1346

Gregory Paul Jordan, M.B., C.M., LL.D. 1346

CORRESPONDENCE.

The Ætiology of Adenoids (Dr. J. Sim Wallace, Dr. Harry Merrall).... 1347

Some Heart Problems (Dr. Theodore Fisher)..... 1347

The Organisation of Medical Education (Mr. J. Herbert Parsons).... 1348

Treatment of Scarlet Fever with Human Immune Serum (Dr. C. Cameron) *(Illustrated)*..... 1348

The Carelli Method of Perirenal Inflation (Dr. F. Hernaman-Johnson) 1349

The Doctor in Country Life (Mr. P. H. Ditchfield) 1355

The Association of Certificated Blind Masseurs 1355

PARLIAMENTARY INTELLIGENCE.

Notes on Current Topics: An Irish Session..... 1349

House of Commons: Importation of Menthol.—Indian Opium Statistics.—Medical Stores for Russia.—Treatment Allowances.—Importation of Chemicals..... 1349

MEDICAL NEWS.

University of Cambridge: Pass-list 1350

University of Liverpool: Pass-list 1350

University of Dublin, School of Physic, Trinity College: Pass-list..... 1350

University of Edinburgh: Pass-list 1351

Royal College of Surgeons of Edinburgh: Pass-list 1351

General Practitioners and Midwives 1322

Health Exposition in N.Y. 1326

Association of Infant Welfare and Maternity Centres 1326

University of Paris: Postgraduate Course in Ophthalmology 1350

Royal Institution 1351

University of London.... 1351

Honour to a Medical Man 1351

Lectures on Hospital Administration 1351

Poplar Hosp. for Accidents 1351

London Panel Committee Dinner..... 1351

Medico-Legal Society: Annual Dinner..... 1352

The late Dr. W. K. Welsh 1352

Eradication of Verminous Conditions in London.. 1352

The late Dr. Thomas Algernon Chapman.. 1352

NOTES, SHORT COMMENTS, &c.

The Health of India after the War 1353

Acousticon Aids for Deaf 1355

The Future of Veterinary Science 1355

An Improved Varnish Rat-Trap 1356

Birmingham Nerve Hospital: Annual Report 1356

The Govt. of India and Indigenous Medicine .. 1356

Criminal Abortion..... 1356

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Medical Diary.—Vacancies 1352

Births, Marriages, Deaths 1352

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An Address

ON THE RELATIONSHIP OF URÆMIA AND HYPERPIESIA.

Delivered at a Meeting of the Bradford Medico-Chirurgical Society on Oct. 5th, 1921,

BY H. BATTY SHAW, M.D., F.R.C.P. LOND.,

PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL AND TO THE BROMPTON HOSPITAL FOR DISEASES OF THE CHEST.

THERE can be no necessity for apology in venturing to discuss these two conceptions—uræmia, an old and familiar one, and hyperpiesia, so new that it has not yet appeared in books of reference—because it is apparent that there is a relationship between them. They seem to mean the same thing in many particulars, yet not in all.

I. THE CONCEPTION OF URÆMIA.

Before the propositions put forward in this address are developed, it is necessary to know the present views on the clinical and pathological significance of the term uræmia. In conditions of health urea is present in the blood to the extent of a quarter to half a gramme in every 1000 g. of blood; in this sense, therefore, uræmia is physiological. There are also numerous clinical conditions in which urea of the blood is increased in amount: in some cases, but not all, there is kidney disease. Moreover, the occurrence of certain well-known symptom-complexes leads us to suspect kidney disease; we speak of these symptom-complexes as manifestations of uræmia—an incorrect designation, inasmuch as it signifies the presence in the blood of urea in excess of the physiological amount, and assumes that this excess is responsible for production of the symptoms called uræmia. It is now admitted that an excess of urea in the blood is not the cause of uræmic symptoms. The wonder is that the expression should still be used by clinicians when our pathological and experimental brethren have shown that uræmia is a misnomer. Clinicians need some special expression to fix the identity of the curious bed-side manifestations described as uræmia; but it is regrettable that so far no more suitable term has been coined to take its place. It is possible now, however, to replace the expression uræmia—a condition hitherto unexplained—by another word which commits no one using it to any particular new theory of causation. Any such proposed change will certainly meet with resistance; indeed, one authority has already said that it would be futile and pedantic to attempt to abolish the word uræmia, although neither urea nor any known element present in the urine, nor urine itself taken as a whole, has been shown to be capable of producing the toxic effects which the term uræmia covers. Before the current definitions of uræmia are studied, it will be found not uninteresting to trace the stages by which the term was introduced.

Growth of Knowledge Concerning Urea.

It is not quite clear whether the discovery of urea was made by Rouelle or by Cruickshank towards the end of the eighteenth century. As early as 1822 Vauquelin and Ségalas D'Etchepare[1] studied the toxic effects of the introduction of urea into the veins of an intact animal. They found no harmful effects; they experimented further on the same animal by injecting 3 oz. of urine into its veins, and it died in a few minutes from widespread clotting of the blood. In 1827 Bostock[2] examined the serums of some of Bright's dropsical albuminuric patients; besides establishing the fact that these serums contained less albumin than those of healthy people, he also found a substance present which resembled urea, and he states that Dr. Prout had found this substance in a dropsical patient six months earlier. Christison[3] in 1829 went a stage further and found that in the serums of patients suffering from dropsy and albuminous urine, dependent upon kidney disease, there was a large quantity of urea. Up to this date investigations had merely shown at the hands of these workers what we know nowadays to be the rule, that urea is present in the blood in health, and may be decreased and increased in health and in disease, but no one had come forward with the idea that the urea present in the blood in cases of dropsy and albuminous urine, dependent upon kidney disease, was the cause of the various toxic symptoms met with in these conditions, until Dr. James Arthur Wilson[4] delivered an address before the Royal College of Physicians in 1833 on "Fits and Sudden Death in connexion with Disease of the Kidneys." He surmised that these manifestations were due to the blood altered by disease of the kidneys. These are his actual words: "The exact change of the blood may require further investigation, but the presence of urea and the deficiency of albumen are those which hitherto chiefly attracted the notice of Dr. Prout and Dr. Bright." Wilson's object was to insist on the "intimate, constant and vital connexion of brain, lungs and heart with the kidneys through the medium of the blood." These remarks uttered by Wilson are generally acknowledged to constitute the first recorded suggestion that urea present in the blood might cause some of the symptoms in Bright's disease. Thus, so long ago, one observer felt that the blood contained toxic principles in cases of Bright's disease. Within a few years of Bright's discovery the poisonous condition of the blood in the cases he described began to be thought of; this is an important point. It is material to this address that to this day it is not known what those poisons are, although urine, urea, and other renal excreta are certainly not the sources of the poison.

Introduction of Term "Uræmia."

Some observers think that the birth of the idea that an accumulation of urea in the blood in cases of Bright's disease is the cause of the toxic symptoms of that disorder is to be found rather in the writings of Robert Willis[5] than in the above remarks of Wilson. Willis said, "All we know would, therefore, lead us to infer, that in the dangerous form of albuminous urine either the formation of urea, wherever this takes place, was suspended, that it was not duly separated from the blood by the kidney, or that," &c. So far, the term uræmia had not been used; according to Marfan[6] we owe the introduction of the word into medical literature to Piorry, who, according to Fournier (De l'urémie: Fournier, Thèse d'agrégat. de Paris, 1863), first used this term in 1847. Frerichs[7] in 1851 discussed "uræmic intoxications." From those times to the present most authorities have continued to use the word uræmia as expressive of the toxic symptoms produced by the blood which has been altered by disease of the kidneys. Observers had before them the clinical records of Richard Bright's 23 cases, and they had before them the coloured plates representing the kidneys met with in those cases. It must be remembered, of course, that in those days there was no microscopic examination of the organs illustrated.

The Three Groups of Bright.

It is now necessary to draw attention to the following quotations from Bright's paper (loc. cit., p. 67). Speaking of the several forms of disease to which the kidney became liable in the foregoing dropsical affections, he thought there were three varieties, if not three completely separate forms of diseased

[1] Journal de Physiol. Expériment. et Patholog., 1822, p. 354.
[2] Bright's "Medical Reports," 1827, vol. i., p. 83.
[3] Edin. Med. and Surg. Journal, 1829, vol. xxxii., p. 285, and Granular Degeneration of the Kidneys, 1839, p. 61.
[4] Lond. Med. Gazette, 1833, vol. xi., p. 777.
[5] Urinary Diseases and Their Treatment, Lond., 1838, p. 123.
[6] Dict. Encyclopédique des Sc. Med., 1866, 5 sér., T.1, Article Urémie.
[7] Die Bright'sche Nierenkrankheit, Braunschweig, 1851, S.87.

structure, generally attended by a decidedly albuminous character of the urine.

"In the first, a state of degeneracy seems to exist, which from its appearance might be regarded as marking little more than simply debility of the organ. . . . I have found it in a case of diarrhœa and phthisis and in a case of ovarian tumour. In the former it was connected with slight and almost doubtful coagulation of the urine by heat; in the latter I had omitted to examine the state of the urine. . . . When this disease has gone to its utmost it has appeared to terminate by producing a more decided alteration in the structure. . . . . In this more advanced stage, if it be the same disease, dropsy has existed and the urine has been coagulable."

On p. 69 (loc. cit.) Bright says:—

"Although I hazard a conjecture as to the existence of these three different forms, I am by no means confident of the correctness of this view. On the contrary, it may be that the first form of degeneracy to which I refer never goes much beyond the first stage."

The first of Bright's three groups is of special interest. As already observed, the kidneys were not subjected to microscopic examination; Bright admitted that albumin was not demonstrated in the urine of all the cases, and he also admitted that the degeneracy observed might after all be simple debility of the kidney. While still speaking of this first group, he admitted that the kidneys belonging to this group might mean progress to later stages, and finally he says that when the disease had gone to its utmost, dropsy and albuminous urine became features, from which it may be inferred that there need be no surprise if in this first group such signs were not present. To these points reference will be again made later on. At the present day there is scarcely any dissent from the view which followed upon Bright's work that certain cases of dropsy and albuminuria are dependent upon kidney disease, and that the other attendant signs and symptoms of these cases are due to poisons present in the blood: no one, however, can say what is the nature of the poisons present except in the negative sense that they are not renal excretions retained owing to loss of power of the damaged kidneys to excrete them.

To return to the years which followed Bright's discovery, other observers were to be found who seemed to agree with Bright as to the slight change in the kidney which may be found in cases of dropsy and albuminuria. Willis,[8] speaking of cases of albuminous urine who showed symptoms always serious and often irresistibly fatal, said this form

"of albuminous urine appears to be connected with a positive alteration in the structure of the kidneys, or *with a state the tendency of which is to end in this*, . . . as accompanying the general dropsical condition of the cellular membrane and serous condition, which is characterised as anasarca."

It is apparent from perusal of Willis's book that a group of writers, including himself, kept an open eye upon the possibility that although many cases of albuminuria and dropsy revealed disease of the kidneys as well, it was not disease of the kidney *per se* which, by alteration of the blood, caused the signs and symptoms met with in such cases. The following passage will be found to be full of interest. Willis[9] wrote:—

"With regard to the pathology of the simple albuminous urine, especially of that which occurs along with general dropsy, opinions are at present very much divided. Whilst some (Bright, Gregory, Christison, Rayer) maintain that the appearance of albumen in the urine of dropsical patients is the never-failing indication of organic mischief going on in the kidney, others (Wells, Cruickshank, Blackall, Graves) have insisted that this circumstance was often indicative of some febrile excitement of the circulating system, of some general or local inflammation, of functional derangement of the kidney at most, and sometimes not even of that, the albuminous impregnation of the urine being the mere effect of a general effusion of a serous fluid into all the cavities and interstices of the body. Mr. Cruickshank[10] in particular held albuminous urine to accompany 'every case of increased action of vessels, more particularly when this was of the inflammatory kind,' and believed that anasarca (which he calls *general dropsy*, and which he obviously considers as a disease dependent on increased vascular action) may be distinguished from the dropsy produced by a morbid condition of one or other viscera, from the circumstance of its always being accompanied by an albuminous state of the urine. Dr. Wells[11] concludes his truly excellent paper, 'On Dropsies that follow Scarlet Fever,' by advocating the practice of blood-letting in such cases, regarding them as connected with a *general inflammatory state of the system*, or, as I prefer to say, with the existence of internal inflammation. Dr. Blackall,[12] too, whose experience and candour deserve and secure our highest consideration, holds the presence of albumen in the urine of dropsical patients to be a certain indication of the existence of a general inflammatory diathesis or of some local inflammation which requires antiphlogistic measures—the abstraction of blood, low diet, &c.—for its subdual."

"It is difficult[13] to resist such high authority; nevertheless, several distinguished practitioners have opposed themselves to the fundamental notion espoused by all the names that have just been mentioned (Bright, Gregory, Christison, Rayer). Dr. Graves,[14] for instance, positively denies that the albuminous state of the urine in dropsies always, or even generally, depends on structural changes in the kidneys. . . . The late Dr. McIntosh, of Edinburgh, and Dr. Elliotson have also expressed themselves against the notion of structural disease as the general cause of serous urine in dropsy of the cellular tissue. Legitimate deduction from my own experience in numerous cases of anasarca succeeding scarlet fever and exposure to cold . . . . would also lead me to conclude that this structural disease of the kidney could not have been the cause of the albuminous state of the urine which I found invariably to accompany the progress of the disease."

My excursions into the medical literature of the days when Richard Bright published his "Medical Reports," and of the years immediately following, have evoked a feeling of wonderment at the acumen and insight of physicians at the beginning of the nineteenth century; it was also interesting to find that there were physicians who were opposed to the deductions Bright had made, so that the heterodox opinions that I am about to offer you have not even the merit of being novelties. With Chaucer I must say:

"For out of the old fieldes, as man saithe,
Cometh al this new corn fro yere to yere;
And out of old bookes, in good faithe,
Cometh al this new science that men lere."

The Assemblie of Fowles.

Conclusions Based on Consideration of the Foregoing.

1. Uræmia is a complete misnomer based upon the erroneous opinion that the urine or renal excreta by retention from kidney disease cause uræmia.

2. The attempts to show that the signs and symptoms of Bright's disease are due to uræmia (*stricto sensu*) at least go to prove that the toxic symptoms met with in Bright's disease, in the minds of some workers of these times, *were* due to a poisonous state of the blood. To Bright and others dropsy and albuminuria in cases in whom the kidney was diseased were directly due to the kidney disease, and presumably so were all the numerous other signs and symptoms. To Willis and others quoted by him the source of the albuminuria and of the dropsy was not to be looked for in the kidney, but in the blood-stream—i.e., to some pre-renal source, e.g., in scarlet fever the albuminuria and dropsy were direct results of the changes in the blood produced by the scarlet fever. Presumably all the other toxic symptoms met with in scarlet fever may be looked for in the blood; indeed, there need be no hesitation whatever in believing that any infection can produce dropsy, albuminuria, and other toxic signs and symptoms, including the actual damage to the kidney itself.

3. It is therefore obvious that probably all cases of so-called primary disease of the kidney may owe all

[8] Loc. cit., p. 121. [9] Loc. cit., p. 154.
[10] Rollo, on Diabetes, Lond., 1798, 2nd edition, pp. 447 and 448.
[11] Transact. of a Society for the Improvement of Med. and Chirurg. Knowledge, Lond., 1812, vol. iii., p. 185.
[12] Observations on the Nature and Cure of Dropsies, Lond. 1813, pp. 266, 271, 275.
[13] Willis (loc. cit.), p. 156.
[14] Dublin Journal of Medical Sciences, 1835, vol. vi., p. 72.

signs and symptoms and the actual diseased condition of the kidneys to altered condition of the blood from some infection, whether chronic or not—e.g., syphilitic toxæmia and various bacterial toxæmias.

4. But just as in syphilis all infected cases do not show kidney disease, albuminuria, dropsy, and other toxic signs and symptoms, so also infections producing changes in the blood do not show, in all cases, the complete pictures above sketched; in some dropsy alone occurs, or albuminuria alone occurs, or the other toxic symptoms met with in so-called uræmia alone occur (to the exclusion of albuminuria and of dropsy); in still others, changes occur only in the kidney, to the exclusion of albuminuria or of dropsy or of both, or of the other signs and symptoms of so-called uræmia.

Definition of Uræmia.

At last, after a rather long preparation, the definition of uræmia so-called, may be given thus: It is a clinical expression which seems to indicate a condition in which the blood is so altered by disease, especially—possibly exclusively—by infections; that changes may occur in the kidneys; that plasma proteins may no longer be retained within the capillaries, &c., owing to leakage through the damaged capillary walls (hence albuminuria, anasarca, and œdema of the lung); that irritation or paralysis may affect the cortex cerebri (hence fits and mania, local or general motor palsies, blindness, deafness, coma, &c.), or the respiratory centres (hence renal asthma or periodic breathing), or may affect the neuro-muscular control of the heart and blood-vessels (hence alteration in the pulse-rate, asystole, "sudden death," &c.), or may affect the gastro-intestinal tract, producing vomiting and diarrhœa, &c. When the kidneys are seriously damaged, then urea, uric acid, and various other crystalloids may be reduced in amount in the urine, and increased in amount in the serum, depending on the failure of the kidneys to act properly—i.e., if not depending upon less intake of nitrogenous food from nausea or loss of it by vomiting, and if the liver is healthy. If the kidneys are not damaged or not seriously damaged, then such change in the urea of the urine or blood may not be observable. When dropsy is a feature there may be concentration of the plasma owing to loss of water, and if albuminuria is excessive there may be a loss of proteins in the plasma.

It will be seen that this definition accounts for those conditions possibly occurring in Bright's first group already referred to when the kidneys were only, as it were, on the way to the eventually advanced state in which dropsy and albuminuria would occur, and met with by Cruickshank, Wells, Graves, and Willis, and by numerous observers since in cases in whom the kidneys were not diseased at all, or if the parenchyma were diseased showed no albuminuria or no dropsy, or showed the latter two phenomena without being diseased, or showed parenchymatous change with or without the other toxic symptoms met with in so-called uræmia.

But how will such a definition apply to those cases in whom so-called uræmia is met with in those who are subject to granular kidneys? It is well known that granular kidneys may be found, even in an advanced stage, in apparently healthy patients who have died from accident or from some disease quite independent of renal disease; therefore in cases of granular kidney showing uræmic (?) symptoms and signs these latter are not due to the granular kidney, but still are referable to a toxic blood state, though in such cases the cause of the toxic blood state is not known. It may be also the cause of the degeneration of the kidneys, whether this is apparently due to vascular disease (for even this must be a blood-borne disease—e.g., as a result of bacterial infection or of syphilis) or is due to capsulitis with successive tubular degeneration, which also must be blood-borne. The toxic state of parenchymatous kidney disease is almost identical in features with that of so-called granular kidneys, though it may be more acute and more remediable in the former, and more chronic and irremediable in the latter.

If the kidney is sufficiently damaged, then anuria may be an added feature, death subsequently occurring from a continuation of the toxic effects of the blood-borne poison, as a rule in three or four days, or a week.

But supposing there is no blood-borne poison at work and anuria occurs from obstructive suppression of the urine or from acute thrombosis of the renal arteries, then how does uræmia express itself? As is well known, little or no uræmia develops at all, and death does not occur for 7 to 11 days, or may be a fortnight. It is not known for certain why death should occur in such cases, but it is possible that the ultimate cause is due to the accumulation of retained unexcreted metabolites, which, as has been shown, are quite unable to produce dropsy or any other of the toxic symptoms of so-called uræmia, but which may quite readily produce vascular paralysis and such low blood pressure that the heart becomes defeated; or it is possible that cellular changes occur throughout the body which has suffered from anuria so long, and that as a result histamine-like bodies are liberated and cause death by dilatation of the capillaries of the body.

Contemporary Definitions of Uræmia.

Having developed this definition of so-called uræmia as a state due to pre-renal toxæmia—which seems so readily to explain the pathogenesis not only of the intrinsic kidney disease, but also of all the attendant symptoms and signs—it is with feelings of hesitation that I now quote the definitions which we owe to contemporary well-known authorities.

"Uræmia is a state of toxæmia *dependent* upon insufficiency of the kidneys which may develop in the course of nephritis or in conditions associated with anuria."[15] "Uræmia is a name given to a group of symptoms which *occur* in nephritis (and in granular kidneys, see context)."[16] "The name uræmia is used for a group of symptoms *arising* during the course of many renal diseases dependent mainly, but not entirely, upon derangement of the nervous system."[17] "The name uræmia is used to designate a group of symptoms which *usher* in the fatal ending in a large proportion of cases of renal disease."[18] "Uræmia may be related to nephritic hypertension."[19] Richard Stern,[20] writing on diseases of the urinary organs, says that "*if the kidneys do not carry out their work well from actual disease or severe functional disorder*, there will *result* very frequently a symptom-complex which is spoken of as uræmia." Nothnagel[21] says that "uræmia is an auto-intoxication *brought about by the retention* not of one excretion, but by all or several constituents of the urine. The nitrogenous end-products may produce the poisonous effects after decomposition in the body."

A careful examination of these definitions will show that the attitude of the various authorities quoted is not identical—they do not all insist that uræmia is caused by retention of metabolites from grave disease of the kidney; some admit that purely functional disease of the kidney may be the cause, which is another way of saying that kidneys showing no organic disease may be associated with the development of uræmic symptoms; others say that uræmic symptoms are associated with kidney disease, but it is left to the reader to discover what the association is; it may be the one already given—viz., that the kidney change and the toxic symptoms are results of a common cause. Further, no one insists that uræmia does not occur except in kidney disease, nor that kidney disease is necessarily followed by or associated with any of the manifestations of uræmia.

[15] Osler and McCrae: Principles and Practice of Medicine, 1920, 9th edition, p. 688.
[16] Sir Wilmot Herringham, Bain's Text-book of Medical Practice, 1904, p. 433.
[17] Sir John Bradford: Allbutt and Rolleston's System of Medicine, 1915, vol. iv., pt. 1, p. 371.
[18] Sir Archibald Garrod: Osler and McCrae's System of Medicine, 1915, 2nd edition, vol. iii., p. 830.
[19] A. E. Taylor: Osler and McCrae's System of Medicine, 1915, 2nd edition, vol. ii., p. 536.
[20] In Von Mering's Handbuch, 1907.
[21] Handbuch d. spec. Pathol. und Therapie, Die Erkrankungen der Nieren, 1896, 1 Aufl., S. 81.

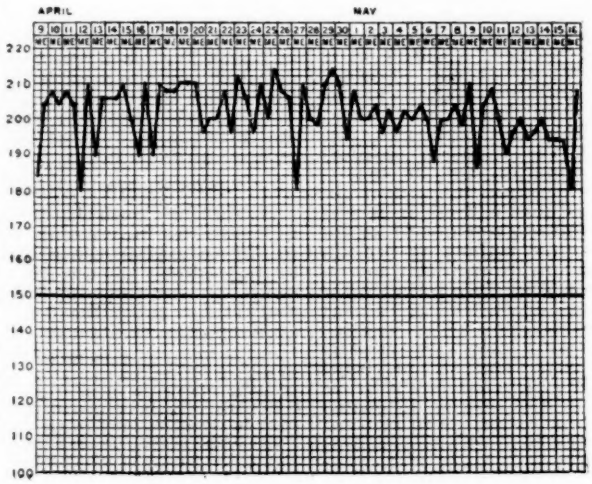
It seems therefore that the view revived by me as to the seat and origin of the poison causing the toxic signs and symptoms met with in so-called uræmia is more satisfactory than that developed immediately after Bright's discovery, and is not negatived by the definitions given by at any rate some contemporary authorities.

II. ILLUSTRATIVE CASES.

I now propose to give a brief account of four cases which have come under close observation, with results of post-mortem examinations, condition of the kidneys in each case, naked-eye and microscopically, as revealed by the post-mortem examination.

CASE A (Fig. 1).—A single woman, aged 50 years, cook by occupation. Three weeks previous to admission to hospital she had developed cough, shortness of breath, palpitation, and frequent vomiting. Her legs began to swell, and this led to her seeking relief. She had had two similar attacks two years and three months previously, respectively. She had had rheumatic fever. On admission she showed signs of mitral disease and cardiac failure—the pulse was irregular; the brachial artery was tortuous; the maximum impulse was diffuse and not forcible; the cardiac dullness to percussion was increased to the left and right; the aortic and pulmonary second sounds were accentuated; ascites, dropsy, and left pleural effusion were present; albuminuria was established on fourteen occasions, and absent on five other examinations; vomiting persisted, but was less frequent; the urine gradually became scanty. During her stay of 21 weeks in the hospital fever was noted only on four or five days; tachypnœa and paroxysmal tachycardia became very marked, and appeared to be relieved by removal of the pleural effusion, but returned again and were not relieved by a second removal of pleural effusion and drainage of the œdematous legs; shortness of breath was much increased, and cyanosis became a great feature; well-marked fits developed four days before death in one of them. The opinion of the physician in charge of this case was that she died from morbus cordis (mitral disease), associated with granular kidney, as shown by the presence of the mitral murmur, pleural effusion, albuminuria, and uræmia.

FIG. 1.



CASE A.—Part of a very full chart drawn up from five months' daily observations.

For permission to use the blocks from which the charts are printed I am indebted to the courtesy of The Oxford Medical Publications, who are preparing for publication my volume on Hyperpiesia.

CASE B.—A bricklayer, aged 45. While at work this man had fallen unconscious and was admitted to the hospital in this condition. On three former occasions he had had attacks of loss of consciousness and convulsions, 15 years, 4 years, and 5 weeks previously. His wife had had three miscarriages. When seen in the wards he was deeply comatose, although it was some hours since his loss of consciousness; his face was flushed and the breathing stertorous; the left arm and leg were flaccid; the supinator-, biceps-, knee- and ankle-jerks were present and equal; the abdominal reflexes were absent, and the plantar responses were extensor on both sides; he was incontinent of urine, and a catheter specimin showed a very small amount of albumin. The temperature was subnormal, and the pulse slow. There was no dropsy. Gradually the heart and respiration failed, and he died three to four hours after admission. The clinical diagnosis was hemiplegia from cerebral hæmorrhage into the right internal capsule.

You would probably have agreed with the clinical diagnosis made in these two cases, but probably you would have wondered what was the explanation of certain peculiar features in these two cases. There can be no doubt that the development of uræmic fits in the last few days of life of Case A would have excited much attention. You would have ransacked your memory to try and remember whether you had ever seen a case apparently of rheumatic mitral disease with cardiac failure resulting from muscular disease of the heart developing attacks of coma and convulsions. There was no escape from the conclusion that this woman died in a uræmic attack, and you would have been confident that the post-mortem examination would reveal one of the more or less familiar diseases of the kidney, especially if I had told you of a clinical feature which, for the purposes of this address, I have not yet mentioned. With regard to Case B, the diagnosis of cerebral hæmorrhage was comparatively easy, but you would have been in difficulties to find an explanation of the three previous attacks of coma and convulsions. A ready explanation for them would be that they were simply attacks of major epilepsy, and then realising that they had come on in middle life in a man whose wife had had three miscarriages you would have suspected that the cause of the epilepsy was some syphilitic disease of the cortex cerebri; but again I have suppressed a certain clinical feature, which encouraged the view that he had been suffering from kidney disease and the attacks were simply uræmic epilepsy.

Turning to the chief post-mortem discoveries in these two cases, it was found that:—

In Case A the heart weighed 20 oz., its chambers were dilated; the chamber walls were hypertrophied; there was mitral stenosis; the liver showed "nutmeg" change. The right kidney weighed 6 oz., and the left 7 oz.—the capsules stripped leaving a smooth surface, the substance was congested and not tougher than normal. Microscopically 4 per cent. of the Malpighian corpuscles were destroyed from past capsulitis, 96 per cent. of the corpuscles were normal except for congestion, the cortex was not reduced, there were small scattered areas of tubular atrophy and of fibrosis, many of the non-atrophied tubules showed cloudy swelling and epithelial degeneration.

In Case B the heart weighed 17½ oz., the left ventricular wall was hypertrophied; there was a large hæmorrhage in the right internal capsule and no signs of cortical disease. The kidneys were of normal size and weighed 7½ oz. each; the capsule was not adherent; on stripping the capsule from the kidney the bared surface was smooth; the cortex was a little reduced. Microscopically 95 per cent. of the Malpighian corpuscles were normal, 5 per cent. atrophied, most of the tubules showed cloudy change in the epithelium as well as granular degeneration, a few tubules were atrophied, and there was some fibrosis.

Puzzling as the clinical accounts of these two cases are, the post-mortem findings are even more so. In both cases the weights of the heart were greatly increased; no doubt mitral disease contributed very largely to the increase in the heart weight in Case A, but why was the heart so much increased in weight in Case B? The idea that the heart may be hypertrophied from heavy manual work or athleticism has been abandoned, so that the occupation as a bricklayer cannot be looked upon as the cause of the increased weight of the heart. Again I must tell you that the clinical feature which I have suppressed in each of these two cases encouraged the view that in both of them, partly in Case A, and wholly in Case B,

there was a ready explanation for the increase in the heart weight. But it will be objected that in Case A part of the cardiac increase of weight was due to the presence of kidney disease (a common clinical association), as shown by the microscopic changes present in the kidney and by the occurrence of uræmic attacks. But what slight changes in the kidney were present in this case! They were probably no more than can be found in the kidneys of healthy individuals who have died of some accident, and they were almost identical with those found in Case B, who did die of an accident—a cerebral hæmorrhage and not of uræmia; therefore any increase of the weight of the heart in Case A, which was not due to the mitral disease, was not due to kidney disease, nor were the uræmic attacks due to the kidney disease. In Case B the heart was found to be greatly enlarged from hypertrophy, and the kidneys showed small change, and it may be conceded that if the earlier attacks of coma and convulsions were uræmic, they also were not due to kidney disease. The question now presents itself for solution, what was the cause for the cardiac hypertrophy and the uræmic manifestations present in these two cases? It has been admitted that mitral disease was present in Case A, and accounted for part of the cardiac hypertrophy: an unexplained residuum is left. These phenomena were not due to kidney disease. I will offer an explanation after consideration of the following two cases:—

CASE C (Fig. 3).—A man, aged 79 years, who had not worked for several years. He was admitted to hospital for shortness of breath on the least exertion, for cough, for palpitation and pain over the heart, and for dropsy of the body and legs.

The brachial artery was tortuous; the pulse irregular; the maximum impulse of the heart was present in the sixth intercostal space, external to the left nipple-line, and was heaving in character; there was an apical systolic murmur; the liver was enlarged; albuminuria was present on three examinations and absent on one; the temperature was normal throughout his stay in the ward. Death was sudden, and the clinical diagnosis of the cause was cardiac failure.

FIG. 2.

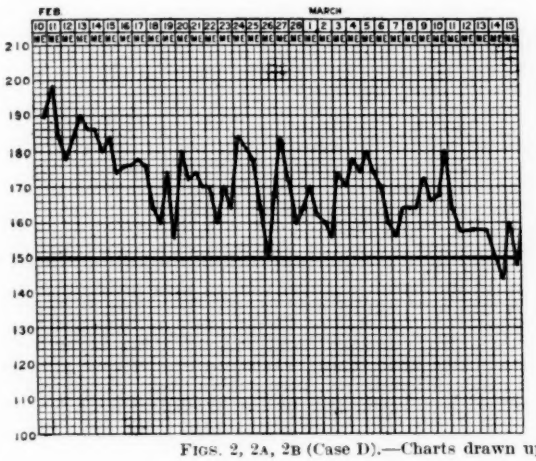
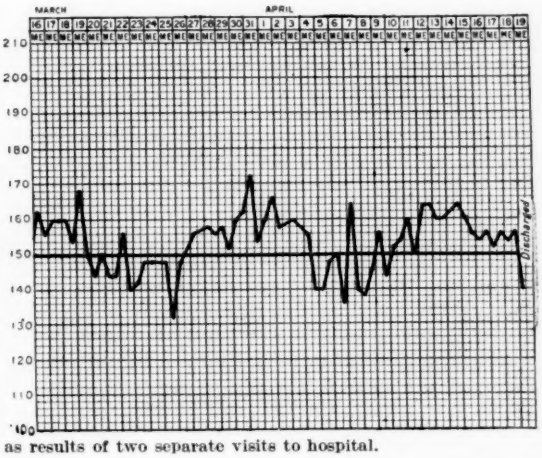


FIG. 2A.



FIGS. 2, 2A, 2B (Case D).—Charts drawn up as results of two separate visits to hospital.

FIG. 2B.

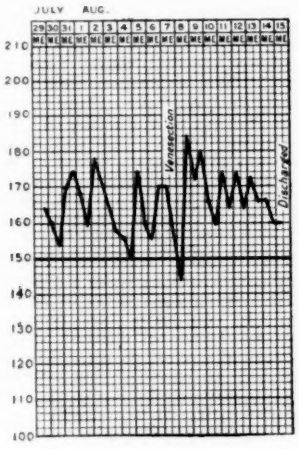
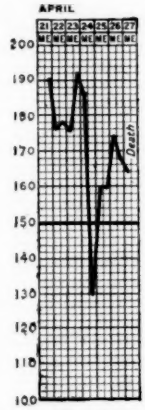


FIG. 3.



CASE C.—Chart of a few days' observations.

CASE D (Figs. 2, 2A, 2B).—A coach-builder (woodwork only), aged 42 years. This man had suffered from shortness of breath, from palpitation and "night starts," from dropsy and from cough, which led to the expectoration of white, frothy material streaked with blood; he had been in the habit of getting up at night to pass water. He had had syphilis, for which he had been treated with mercury continuously for 15 months. He had been admitted to the hospital on three separate occasions, always with the same symptoms, except that on the last admission he had noticed that he was passing very little water. He was a stout, healthy-looking subject; the maximum impulse was present in the fifth intercostal space in the left anterior axillary line; there was a loud systolic murmur at the maximum impulse; rhonchi were heard over both lungs; there were dropsy and ascites and the liver was enlarged; the temperature as a rule was normal, but on a dozen occasions was raised a little over 99°; the urine was frequently examined, and always showed albumin; casts were found in the urine, and hæmaturia occurred on several occasions; dyspnœa and cyanosis became so great that he was venesected with considerable relief; ultimately a presystolic murmur was heard at the maximum impulse. The pulse was irregular, but electro-cardiographic observations favoured the view that this was due merely to functional, not organic, defect of the right branch of the auriculo-ventricular bundle; the brachial arteries were tortuous. Death occurred gradually with marked dyspnœa. The blood taken during life gave a positive Wassermann reaction.

In passing comment on Case C, it looks as if this old man had simply died from heart disease, the lesions being leakage of the mitral valve and disease in the conducting fibres of the heart wall. The usual features of cardiac failure developed and the sudden death was explainable on the ground that possibly auricular fibrillation had closed the scene. Case D was another example of illness due to heart disease, and the presence of syphilis suggested that this disorder had damaged the mitral valve, producing a characteristic double murmur and changes in the heart muscle, leading to failure of compensation as shown by dropsy, enlarged liver, albuminuria, &c.,

and possibly infarction of the kidneys accounted for the hæmaturia. The presence of casts and, towards the end, great reduction in urine, may suggest that possibly there was some serious disease of the kidneys of the nature of Bright's disease. Again I must tell you that I have suppressed the fact that another clinical sign was present, which I have satisfied myself is not a feature in cases of mitral valvular disease, or of degenerative disease of the heart muscle, both of which features appeared clinically to be present in Cases C and D.

I will now give the post-mortem findings of these two cases:—

In Case C the heart was found to weigh 17½ oz., the ventricular walls were hypertrophied; all the valves were free from disease; the coronary arteries were atheromatous but not occluded; the cardiac muscle was not fibrosed; the liver was "nutmeg," and there was fluid in one pleural cavity and in the peritoneum. The kidneys weighed 5½ oz. each; the capsules were thick and adherent; the surfaces were finely granular; the cortex was not reduced. Microscopically 3 per cent. of the Malpighian corpuscles were destroyed, 97 per cent. were normal; there were small areas of tubular atrophy and fibrosis; the main bulk of the tubular epithelium was swollen and undergoing degeneration.

In Case D the heart weight was found to be 39 oz.; the ventricular walls were hypertrophied and the chambers dilated; there was no valvular disease; the liver was enlarged and showed a "nutmeg" appearance. Each kidney weighed 10 oz.; the capsule of each organ was thickened and adherent, and the surface laid bare was smooth. Microscopically it was found that about 5 per cent. of the Malpighian corpuscles were destroyed, 95 per cent. were normal; the cortices showed well-marked tracts of atrophy and fibrosis; the bulk of the tubules showed swollen epithelium or granular degeneration.

It is therefore clear that the diagnosis that these cases had died from valvular disease was quite wrong; the murmurs heard must have been simply due to dilatation of the chambers of the heart and of the valvular orifice concerned. As already admitted, defective action of the valves may have been responsible for the increased weight of the hearts in these two cases, but again I may remind you that each case revealed a clinical manifestation which I have not mentioned which could explain the cardiac hypertrophy, and which some authorities think could explain how it was that the murmurs were heard. As to the kidneys, it will, I think, be agreed that there was little wrong with them, judged by the microscopical findings; and even accepting, for the moment, the prevailing view that uræmia is associated with grave kidney disease, the absence of uræmic symptoms in these cases would cause no surprise when the slight changes in the kidneys are observed.

III. DISCUSSION OF CASES.

The details of Cases A, B, C, and D must be kept in view as clearly as possible. A feature common to all four is the presence of a very large hypertrophied heart; but another feature almost as striking is that, despite the frequent occurrence of albuminuria, the kidneys in all four cases are practically normal. Tortuosity of the brachial artery was present when looked for. Now I disclose to you the fact that in each of these cases the blood pressure was raised, though only two observations were possible in Case B, each being 256 mm. The chart of Case A is part of a very full one, drawn up from five months' daily observations. The chart of Case C represents only a few days' observations, and the charts of Case D were drawn up as the result of two separate visits to the hospital. I think there can be no doubt that hyperpiesis was present in each of these four cases. My opinion is that these four cases represent what Sir Clifford Allbutt has described as hyperpiesia.[22] To use his own words, hyperpiesia "is a malady in which blood pressure rises excessively, a malady having a course of its own and deserving the name of a disease." I may add that it may be fatal, because cases C and D, though appearing to die of valvular and muscular disease of the heart, had no valvular disease, nor any other disease which could have proved fatal. The cause, I think, of their deaths was toxic in origin, and the end was brought about by the "defeat" of the heart, to use Sir Clifford Allbutt's own term, rather than by disease of that organ. I do not think that hyperpiesia is due to the gradual narrowing of the arteries of the body by any of the processes which masquerade under the name of arterio-sclerosis, and for a very simple reason. If you look at the first portion of the pressure chart of Case A you will see that in about a fortnight the pressure had become normal, and that about three weeks later it was higher than it ever had been. There was no discoverable intercurrent severe inflammation which could have caused the fall, and which, being recovered from, could have allowed the pressure to rise again. Nor can we imagine that arterio-sclerosis had departed in a fortnight, and during three weeks had again reached such a pitch as to make the blood pressure higher than before. It seems much simpler, therefore, to hypothecate a pressor toxin (or toxins) which, circulating in the blood, leads to contraction (but not to occlusion) of the arteries, with the result that the heart hypertrophies, and the strain induced by this interplay of heart and arteries causes the blood pressure to rise and the arteries to lengthen and become tortuous. There can be no reason to think that in these four cases the kidneys were in any way capable by chemical agency of causing the rise of blood pressure, because they were so little diseased, and because it has never been established that renin[23]—a pressor substance present in the kidneys—is responsible for physiological normal blood pressure, or for hyperpiesia. I do not know where this hypothetic toxic body (or bodies) originates, but I believe it is distributed by the blood-stream, and I believe it is pre- or extra-renal in origin.

I do not entirely agree with Sir Clifford Allbutt[24] because I believe that hyperpiesia in its later stages *may* reveal symptoms identical with those met with in certain well-known forms of kidney diseases—Case A was felt by the physician in charge to have died partly, if not entirely, from uræmia dependent upon granular kidney; but, as previously stated, the kidney was practically normal. Now I must confess that a large proportion of the cases of hyperpiesia which I have studied reveal granular kidney, or some other coarse form of kidney disease; but a very considerable number, though less, showed no more disease of the kidneys than I have related in the above four cases. Many of these latter cases—i.e., those who did not reveal kidney disease like Case A and Case B—revealed symptoms eminently uræmic, so I am prepared to go much further than Sir Clifford Allbutt, and to say that hyperpiesia may, in its more dangerous phases, exactly simulate the symptoms of various well-recognised forms of kidney disease, without the kidneys being diseased at all. The first part of my lecture aimed at showing that uræmia was due to poison (or poisons) circulating in the blood which was in no way referable to the faulty action of the kidneys, and I quoted Bright's contemporaries, some of whom firmly believed that albuminuria and dropsy, and presumably other symptoms and changes associated with them, even the kidney disease, were due to some general cause operating in the circulatory system.

CONCLUSION.

I have aimed at trying to show that in hyperpiesia we can find all the manifestations familiar to us in the past as uræmic. I have also tried to show you that hyperpiesia and uræmia—so-called—are due to the circulation of a blood poison (or poisons) which are not due to a fault of the kidney. It is common knowledge that the term uræmia is a misnomer, useful clinically, but unsupported by experimental investigation. Then, I maintain, the relationship of uræmia and hyperpiesia is easily settled. Hyperpiesia reveals in its advanced stages each and every manifestation

[22] Diseases of the Arteries, including Angina Pectoris, London, 1915, vol. i., p. 10.

[23] THE LANCET, 1906, i., p. 1295, et seq.

[24] Diseases of Arteries, 1915, vol. i., p. 346.

met with in uræmia. I believe that when a case presents so-called uræmic manifestations, hyperpiesis is present, and if it is absent then at death cardiac hypertrophy will be found, showing that it had been present at one time or another. "Hyperpiesia" and "hyperpiesic," to my mind, are words preferable to "uræmia" and "uræmic": they do not commit us to an exclusive pathology, and as I have shown, I trust, are infinitely more accurately descriptive.

I have but one regret—I cannot describe the poisons circulating in the blood which produce hyperpiesis or any of the other symptoms of hyperpiesia; but I feel sure they are in the blood, and that they are in no way expressive of defective action of the kidneys. I must, in conclusion, add that I think many of the phenomena met with in the later stages of hyperpiesia, when symptoms of a so-called uræmic character develop, are much more likely to be due to toxins present in the blood as the result of some inflammation, somewhere in the body, than to metabolites present in the blood in excess owing to the default of the kidney whose duty it is to extrude such bodies.

SEROLOGICAL AND MORPHOLOGICAL CHARACTERISTICS OF THE PNEUMOCOCCUS:

AN ANALYSIS OF ORGANISMS ISOLATED FROM 77 CASES OF PNEUMOCOCCAL INFECTION.

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IN April, 1920, Sir Frederick Lister forwarded from the South African Institute for Medical Research some of his standard strains of pneumococci, with their homologous antisera, which he had isolated from cases of lobar pneumonia occurring in the mining area, in order that they might be compared with strains of pneumococci present in this country. In this communication comparison has been made with pneumococci isolated from cases of lobar pneumonia, and with those obtained from cases of pneumococcal infection other than lobar pneumonia. These results have also been correlated with those of the Rockefeller and other workers by means of Rockefeller anti-pneumococcal serums, so that it was possible to compare the results obtained with those of Lister and American workers.

The following list gives the relationship between the two nomenclatures:—

Lister's group.		Rockefeller type.
C	=	I.
B	=	II.
E	=	III.
A, D, F, G, H, J, K, X and unclassifiable	=	IV.

In some of the figures quoted below it will be seen that Type II. Rockefeller has been further subdivided, and Types IIa., IIb., and IIx. are noted which agglutinate slowly and incompletely with standard Type II. antiserum.

Isolation of Pneumococci from Pus and Sputum.

Pneumococci were obtained in pure culture from hæmocultures, but when sputum or pus was examined the organism was one of several present in the specimen, and although by looking at stained preparations of such material one could detect the typical capsulated pneumococci in large numbers, it was found to be very difficult in many cases to separate them from the other organisms present. For some time past Dudgeon's method (Wordley, 1921) has been employed, and has given most satisfactory results. Unglazed porcelain tiles 3 inches by 3 inches, sterilised by heat, were spread with the pus or sputum. The excess of moisture was rapidly taken up by the tile, and the resulting sticky mass was transferred to a second tile, spread out and left to dry to a flaky powder (1–3 hours). The powder was scraped from the tile, and a quantity spread on a blood-agar plate which was then incubated. By this means it was possible to get a plate on which the colonies were well separated, even although the original material contained many types of organisms. In specimens in which the types of organism are few, blood-agar slopes have been used in place of plates with satisfactory results. It is necessary to employ a glass screen mentioned by Wordley in his description of the method for the protection of the worker, as the powdered sputum is a dangerous source of infection, and in several instances contained tubercle bacillus.

Morphological and Cultural Characteristics.

The morphological and cultural characters of the pneumococcus noted in this paper have been examined. The typical appearance of the pneumococcus, a Gram-positive capsulated diplococcus pointed toward the free ends, and broader at the opposed surfaces, is best made out in fresh films of pus or sputum. It has been noted by many observers that these typical appearances may rapidly disappear on culture, and—by the loss of capsule formation, and the occurrence of chain formation, such as is frequently seen in cultures in liquid media—the pneumococcus may become indistinguishable from the streptococcus. In fluid cultures the pneumococcus forms a cloud throughout the medium, and on blood-agar the colonies are discoid and slightly granular. After 24 hours the colonies and the blood medium become brownish or greenish-brown, and this colour deepens with the age of the culture. Park and Williams (1905) have noted that this green colour is present in atypical colonies, and may be present in typical strains.

The cultural reactions of 77 strains of pneumococci have been noted on lactose, glucose, mannite, saccharose, starch, inulin, salicin, inosite, and litmus milk, the "sugar" media all containing 0·5 c.cm. of blood serum. The action on mannite, salicin, and inulin was variable, some strains producing acid, some having no action on the "sugars." Inosite was not fermented in any case. The remaining "sugars" and litmus milk were acidified in every instance. These strains of pneumococci were members of different serological groups, but no indication of grouping could be obtained from the fermentation reactions on the above-mentioned substances.

Twenty-eight strains of streptococci obtained from various sources have been tested in the same way, and in many instances similar reactions to those of the pneumococci were recorded. From these observations and those of Cole (1913), Dochez and Gillespie (1913), Logan (1921), and Cooper, Mishulow and Blanc (1921), all of whom have obtained somewhat similar results, one comes to the conclusion that as a means of classification of pneumococci the fermentation tests are of no value.

Results of Blood Culture in Pneumococcal Infections.

Blood cultures have been made in cases of pneumococcal infections during the pyrexial period, nutrient glucose-broth and distilled water being used as culture-media. White (1899), in giving results of blood cultures made in cases of pneumonia, quotes figures given by several workers. Stillman, examining 18 cases of pneumonia, obtained 6 positive cultures; in 2 of these the cocci were seen in blood films only, and did not grow in the culture-media. Of 12 cases in which negative blood cultures were obtained, 2 died; of 6 positive cases, 4 died. Kohn in 32 cases found the pneumococcus in the blood of 9 cases, of which 7 died and 2 recovered. Of 13 negative cases (including 2 cases dying of complications), 8 recovered. At a later date, he found that a considerable majority of the negative cases recover, whilst a similar proportion of the positive cases die. He concludes that the presence of the pneumococcus in the blood gives a very unfavourable prognosis. White found that of 19 cases of lobar pneumonia, all at least moderately severe, 10 were fatal. Thirty-two blood cultures were

made, and in 3 cases the pneumococcus was found in life. In 2 of these positive cases general pneumococcal infection was found post mortem. In 8 cases with negative blood cultures, although the pneumococcus was present in the lungs, no evidence of a general pneumococcal infection was found post mortem.

Thirty-four blood cultures were made during this work, and of these 19 were positive and 15 negative. The pneumococci have been typed and are distributed as shown in Table A.

TABLE A.

Rockefeller Nomenclature.	Lister's Nomenclature.	Number of blood cultures.	Positive.	Negative.
—	Group A	2	1	1
Type I.	,, C	20	8	12
,, II.	,, B	7	5	2
,, IV.	Unclassified.	5	5	0

In Lister's Group A 2 patients were examined by blood culture: one, a case of lobar pneumonia with empyema (positive), died; the other, a case of broncho-pneumonia (negative), recovered.

In Type I. the 8 positive results were obtained in 5 cases of lobar pneumonia, 2 of meningitis, and 1 of septicæmia. The negative cultures occurred in 10 cases of lobar pneumonia, 1 of broncho-pneumonia, and 1 of chronic empyema. Of these 8 positive blood-culture cases 5 died, 2 of lobar pneumonia, 2 of meningitis, and 1 of pneumococcal septicæmia. Of the 12 cases in which negative blood cultures resulted 2 died, one of lobar pneumonia, and the other of a chronic empyema associated with advanced waxy disease.

In Type II. the 5 positive blood cultures were all obtained from cases of lobar pneumonia, while 1 lobar and 1 broncho-pneumonia gave negative results. Of the 5 positive cases, 2 died; both negative cases recovered.

In Type IV. 5 positive cultures were obtained, 3 from cases of lobar pneumonia, and 2 from pneumococcal meningitis. Both meningitis cases and 1 of the pneumonia cases died.

In all cases, in which a positive culture was obtained, the examination was made within seven days of the onset of the disease, and it is noted that of the 4 cases of meningitis examined all had positive blood cultures and all died. In the cases where a negative culture resulted, 7 were made during the first week of illness, 4 during the second week, 1 during the third, 2 during the fifth, and 1 from a chronic empyema established for seven years in which a pyrexial condition was present. In those cases of pneumonia with pyrexia during the third and fifth weeks an empyema was present.

From an examination of these results it will be seen that of 19 positive blood cultures death resulted in 11 cases, whereas in 15 cases where a negative blood culture was obtained, 2 died; one a case of lobar pneumonia which died on the eighth day, the other a case of chronic empyema with advanced waxy disease. Although the number of cases examined by blood culture is small, it would appear that in cases of pneumococcal infections a positive blood culture is of grave significance.

Formation of Specific Agglutinins and Opsonins in the Blood Serum of Persons Suffering from Pneumococcal Infections.

Lister (1913) pointed out that the serums of patients recovering from lobar pneumonia usually acquire opsonins and agglutinins for the particular strain of pneumococcus responsible for the infection, and that "virulent" pneumococci—i.e., pneumococci directly derived from a hepatised lung—are readily phagocyted and agglutinated by such serums. These antibodies are not found in the early stages of the infection, but appear at or about the time of the crisis, and continue in the blood for some time after this period. The blood serums from the pre-critical stage of 18 cases of lobar pneumonia, 2 from early broncho-pneumonia, 5 from pneumococcal meningitis, 1 from bronchitis, 1 from a pneumococcal septicæmia, and 2 from cold in the nose—29 in all—have been tested against type strains or strains obtained from the cases, in no instance was any evidence of agglutination or phagocytosis of the pneumococci noted. Similarly 41 serums taken after the crisis in cases of lobar pneumonia, or at a late stage of other infections, have been examined for the presence of opsonins and agglutinins. Table B shows the results obtained.

TABLE B.

Nature of infection.	Positive.	Negative.
Lobar pneumonia	24	1*
Broncho-pneumonia	6	3
Chronic empyema	2	0
Bronchitis	0	3
Septicæmia (pneumococcal) ..	0	1*
Cold in head	0	1

* Subsequently died.

These findings are in agreement with those of Lister as regards the lobar pneumonia cases, but cases of broncho-pneumonia and chronic empyema also appear to produce antibodies in the serum. These antibodies may be used to determine the type of pneumococcus which has caused the infection and may serve as a useful guide to vaccine therapy. In the following Tables I., II., III., and IV. are noted the cases from which these observations have been made. The technique of the agglutination method used during this work is similar to that used by Sir F. S. Lister (1913), who modified Sir A. Wright's opsonic-index method for this purpose. Thick dehæmoglobinised blood films have been used for the observation of agglutination and phagocytosis of the cocci in preference to the usual blood films, as by this means the clumps of pneumococci are not submitted to the action of the spreader.

Serological Reactions of 77 Strains of Pneumococci Isolated from Various Sources.

In the following tables are set out the chief particulars of the pneumococci isolated during this work in their serological groups. Where agglutinins and opsonins were developed in the blood serum of the cases examined, strains of cocci derived from two separate sources where possible—such as blood culture and empyema pus—were tested with this serum and with standard anti-pneumococcal serum. Thus in Table I., No. 43, strains of cocci, obtained from the sputum and from empyema pus, agglutinated with anti-pneumococcal serum Type I., and with the post-critical serum of the case, phagocytosis of the cocci being present. In Case 71, Table I., a case of meningitis, death took place; the blood serum contained no agglutinins, both strains isolated from the cerebro-spinal fluid and from the blood culture agglutinated with Type I. antiserum. In no case have two "standard" strain pneumococci (and by this I understand Types I., II., and III.) been isolated from any single patient, nor have agglutinins or opsonins for more than one strain of pneumococci been found in the post-critical serum of any case.

Pneumococcus C Lister, or Type I. Rockefeller.

In Table I. are set out the "C" Lister or Type I. group of pneumococci. This group contains 31 members, of which 26 were obtained from cases of lobar or broncho-pneumonia, and it is noted that 11 of these cases were complicated by empyema formation. Of these 31 cases eight died, four of pneumonia, one complicated by a terminal meningitis (No. 173, a chronic empyema of seven years' standing, who was in a state of advanced waxy disease on admission to hospital for operative treatment), one of meningitis, and one of septicæmia (No. 182).

Case No. 182 is of interest, as chronic lymphatic leukæmia had been present for some two years prior to the terminal infection. This patient was infected with what appeared to be an influenzal cold, but his condition became serious. There were fleeting signs of pneumonic consolidation in the lungs, but no definite areas could be located. Positive blood cultures, in which enormous numbers of pneumococci were found after 12 hours' incubation, were obtained on four separate occasions during the 14 days of acute illness. Thus in this case a pneumococcal septicæmia persisted for

TABLE I.—*Pneumococcus C. Lister, or Type I. Rockefeller.*

No.	Disease.	Age.	Day of disease.	Source from which pneumococcus was isolated.	Agglutinins in serum. A.C.	Agglutinins in serum. P.C.	Hæmolysis.	Lysis in bile salt.	Result
124	Lobar pneum.	20	5	Sputum.	−	+	−	+	R
113	,,	19	4	Bl. cult.	−	+	−	+	R
70	,,	40	P.M.	Heart blood.			−	+	D
43	Lobar pneum., empy.	24	12	Sputum, empy. pus.		+	−	+	R
167	,,	31	35	,,		+	−	+	R
166	,,	24	35	,,		+	−	+	R
157	Lobar pneum.	25	5	Sputum.	−		−	+	D
141	Lobar pneum., empy.	6	14	Empy. pus.		+	−	+	R
125	,,	?	21	,,		+	−	+	R
111	,,	5 5/12	4	Bl. cult., empy. pus.	−	+	−	+	R
95	,,	46	10	Sputum, empy. pus.		+	−	+	R
69	,,	7	14	Empy. pus.			−	+	R
173	Lobar pneum., meningitis.	28	7	Bl. cult.	−		−	+	D
169	Lobar pneum.	24	6	Bl. cult., sputum.		+	−	+	R
81	,,	14	4	,,	−		−	+	D
103	Lobar pneum., empy.	28	11	Empy. pus.		+	−	+	R
178	,,	8	12	,,		+	−	+	R
134	Broncho-pneum.	42	5	Sputum.	−	+	−	+	R
164	,,	Adult.	8	,,		−	−	+	R
105	Bronchitis.	,,	5 yrs.	,,	−	−	−	+	N
102	,,	,,	?	,,			−	±	N
152	Broncho-pneum., empy.	21	35	Empy. pus.		+	−	+	R
64	Asthma.	Adult.	?	Sputum.			−	+	N
128	Old empy. Waxy disease.	48	7 yrs.	Sputum, empy. pus.		+	−	+	D
71	Meningitis.	5	4 days.	Bl. cult. C.S. fluid.	−		−	+	D
180	Peritonitis.	41	2	Pus.			−	+	D
182	Lymphatic leukæmia septicæmia.	52	4	Bl. cult.	−	−	−	+	D
139	Cold.	35	2	Throat swab.	−	−	−	+	R
61	,,	24	3	,,			−	+	R
132	Corneal membrane.	5/12	3	Eye.			+	∓	Blind.

TABLE II.—*Pneumococcus B. Lister, or Type II., U.S.A.*

80	Lobar pneum.	20	2	Bl. cult., sputum.	−	+	−	+	R
74	,,	17	1	,,	−	+	−	+	R
78	,,	24	11	Sputum.		+	−	+	R
73	,,	47	3	Bl. cult., sputum.	−	−	−	+	D
165	,,	29	4	Sputum.	−	+	−	+	R
149	,,	18	6	Not isolated.		+			R
148	,,	48	2	Bl. cult., sputum.	−		−	+	D
75	,,	18	5	,,	−	+	−	+	R
145	Broncho-pneum.	19	13	Sputum.		+	−	+	R
119	Pleurisy.	38	3	,,			−	±	R
107	Asthma.	34	4	,,			+	+	R

TABLE IIA.—*Pneumococcus A. Lister, or IV. Rockefeller.*

89	Lobar pneum., empy.	3	12	Bl. cult., pus, sputum.		+	−	+	D
168	,,	64	35	Sputum, empy., pus.		+	−	+	R
118	Empy., growth of lung.	40	48	Empy. pus.		−	−	+	D
122	Broncho-pneum.	46	10	Sputum.		+	−	+	D
104	,,	36	10	,,		+	−	+	R

TABLE III.—*Pneumococcus Type IV. Rockefeller. Sub-group Harding.*

78	Lobar pneum.	51	5	Bl. cult., sputum.	−	+	−	+	R
175	,,	53	3	,,	−		−	+	D
154	Bronchitis.	30	Weeks.	Sputum.			−	+	N
144	Post-anæsth. bronchitis.	24	4	,,			−	+	R
140	Influenza and bronchitis.	32	10	,,			−	+	R
138	Post-anæsth. bronchitis.	Adult.	5	,,		−	−	+	R
84	Meningitis.	23	2	Bl. cult., C.S. fluid.			−	+	D
146	Cold.	18	5	Throat swab.			−	+	R
	Sub-group Hinman.								
130	Tuberc. broncho-pneum.	26	Weeks.	Sputum.	−	−	−	+	N
163	Chronic bronchitis.	Adult.	Years.	,,			−	+	N
174	Post-anæsth. broncho-pneum. and empy.	52	4 days.	,,	−		−	+	D
	Sub-group 5073.								
126	Meningitis.	24	3	C.S. fluid.			−	∓	D
161	Pleurisy, empy.	28	5	Empy. pus.			−	+	R
112	Chronic bronchitis.	Adult.		Sputum.			−	+	N

TABLE IV.—*Pneumococcus Type IV. Rockefeller Unclassified.*

155	Lobar pneum.	34	6	Bl. cult., sputum.	−	+	−	+	R
143	Lobar pneum., empy.	6	14	Sputum.		+	−	+	R
179	Lobar pneum.	16	9	,,		+	−	+	R
183	Lobar pneum., empy.	3	12	Empy. pus.			−	+	R
103	Bronchitis.	Adult.	Years.	Sputum.		−	−	+	N
156	,,	28	3 mths.	,,		−	−	+	R
114	,,	Adult.	Months.	,,		−	−	+	N
153	Bronchitis, asthma.	27	7 days.	,,			−	+	N
123	Bronchitis, post-anæsth.	20	3	,,			−	+	R
150	,,	38	Weeks.	,,			−	+	N
121	Broncho-pneum.	32	14 days.	,,		+		+	R
120	Meningitis.	4/12	6	Bl. cult., C.S. fluid.	−		−	+	D
171	Cold.	45	5	Sputum.			−	+	N
147	,,	44	Weeks.	Throat swab.			−	+	R
109	,,	18	3 days.	Sputum.			−	+	N
115	,,	40	Weeks.	,,			−	+	N

A.C. = Pre-critical serum. P.C. = Post-critical serum, or serum taken late in the disease.
− = Negative result. + = Positive result. ± = Indefinite result. R = Recovery. D = Died. N = Unknown.
Empy. = Empyema. Bl. cult. = Blood culture.

In these tables it will be noted :—

(1) That the absence of hæmolytic activity of the pneumococci, when tested in a peptone-water medium containing 0·05 c.cm. of human red cells, has been observed in all but two instances : Table I., No. 132, and Table II., No. 107.

(2) That the lytic action of 2 per cent. sodium taurocholate in distilled water on the pneumococci has been observed in every instance, in two apparent exceptions : Table I., No. 132, and Table III., No. 126 ; lysis took place after these strains had been sub-cultured several times.

14 days. Five days before death melæna was present, and the last culture, taken two days before death, contained not only the pneumococcus in large numbers, but also streptococci and the paratyphoid "C" bacillus. At no period of the septicæmia were agglutinins or opsonins found in the blood serum. Unfortunately no post-mortem examination could be made.

Case No. 132 was that of a child of 5 months, who was seen suffering from a membranous condition of both conjunctivæ. A Type I. pneumococcus was isolated; the child became blind.

Of the 31 cases of C or Type I. infection it is noted that 26 were isolated from cases of severe illness, and that five were obtained from mild infection, two of common cold, two of bronchitis, and one of asthma.

Pneumococcus B. Lister, or Type II. Rockefeller.

In Table II. are set out the particulars of the 11 cases forming this group. Eight of these cases are lobar pneumonia, 1 broncho-pneumonia, 1 pleurisy, and 1 asthma. Two cases, both of lobar pneumonia, died. None of these cases developed empyemata. The only cases of familial infection by the pneumococcus which have been encountered in the course of these investigations occurred in this group.

Three cases (Nos. 73, 74, and 78, Table II.) were all living in the same house, and all were admitted to hospital within seven days suffering from acute lobar pneumonia. No. 73, the father, aged 47, was admitted on the second day of illness. The left base was consolidated, and later the whole left lung became involved. Blood culture made upon the third day of the illness contained Type II. pneumococci in large numbers. Crisis occurred on the eighth day, but the post-critical serum contained no agglutinins or opsonins. Death took place on the ninth day from cardiac failure. At the post-mortem the left lung was in a state of grey hepatisation. The right lung was very congested, and in parts almost solid. No. 74, son of No. 73, aged 17, was admitted on the first day of illness suffering from hæmoptysis and pain in the left chest. Consolidation of the left base was present. The temperature fell by lysis on the seventh, eighth, and ninth days. Convalescence was normal. Blood culture made on the second day contained numerous pneumococci Type II., and a Type II. pneumococcus was isolated from the sputum. The post-critical serum contained both opsonins and agglutinins for Type II. pneumococcus.

No. 78, a son of No. 73, was admitted to hospital on the first day of illness. The right base was consolidated, the left base congested. The temperature fell by crisis on the seventh day, and convalescence was normal. This patient was not investigated until the eleventh day, when the temperature was normal. From the sputum a Type II. pneumococcus was isolated, and his post-critical serum contained agglutinins and opsonins for the Type II. pneumococcus.

These three cases serve to illustrate the occasional occurrence of a small epidemic of lobar pneumonia. Case No. 119, Table II., presented the clinical signs of pleurisy, and although rusty sputum was expectorated in considerable quantity, no consolidation of the lung was located. A Type II. pneumococcus was isolated from the sputum. A Type II. pneumococcus was isolated from one case of mild infection, No. 107, the remaining 10 cases were severely ill.

Pneumococcus A Lister, Type IV. Rockefeller.

In Table IIa. are set out the five strains of Lister's A pneumococcus, which have been isolated during this work. As noted above, Lister (1917) states that 31 per cent. of the pneumococci isolated by him have belonged to this group, 21·6 per cent. to the C group, or Type I. Rockefeller, and 16·2 per cent. to his B group, or Rockefeller Type II. Strains of this Type A pneumococcus were sent to the Rockefeller Institute, examined by Dochez and Gillespie (Lister 1913), and placed in Type IV. This strain has apparently not been found in America. In examination of the serological characteristics of these Type A pneumococci by the opsonic technique with 15 minutes' incubation, no agglutination or phagocytosis of the cocci occurred, but when the incubation time was increased to one hour some small but definite degree of reaction was noted and these A pneumococci have been placed in this communication as a sub-group of Type II. for this reason. Two cases of lobar pneumonia, both of which were complicated by empyema, and two cases of broncho-pneumonia were infected by this A pneumococcus, and in all four cases agglutinins and opsonins were present in the blood serum. In the fifth case, No. 118, Table IIa., a malignant growth of the lung was present; an empyema developed, from which this A pneumococcus was isolated. This case died, but no antibodies were found in the blood serum.

This Type A pneumococcus, so frequently observed in the natives of South Africa, is therefore present as a pathogenic organism in this country, though it has not yet been definitely identified by workers in America. Of the 5 cases due to this type of infection, 3 died, the causes of death being lobar pneumonia, broncho-pneumonia, and empyema complicating malignant disease of the lung. As far as one can judge from this small series of cases the presence of the Type A pneumococcus is associated with a severe type of infection.

Pneumococcus Unclassified Lister, Type IV. Rockefeller.

Thirty strains of pneumococci have been isolated which do not correspond to Lister's F, G, J, or K strains, and must therefore be placed in his unclassified list—that is, the Rockefeller Type IV. From these 30 strains 4 have been taken and antiserums (designated Harding, Hinman, Eccles, and 5073) prepared. Pneumococci Harding and 5073 were isolated from 2 cases of meningitis; Hinman and Eccles were obtained from the sputum of cases of chronic bronchitis. With these 4 antiserums it was possible to group 14 of the 30 Type IV. pneumococci. In Table III. are set out the particulars of these sub-groups Harding, Hinman, and 5073.

Sub-group Harding: Eight Cases.—No. 84, Table III., was the standard strain of this group, and was obtained from the blood stream and cerebro-spinal fluid of this case of meningitis before death. Seven further strains of this sub-group have been identified, two from cases of lobar pneumonia, four from bronchitic sputums, and one from common cold. Two cases—the original meningitis case, and one case of lobar pneumonia—died.

Sub-group Hinman: Three Cases.—No. 130, Table III., was the standard strain of this small group, and was isolated from the sputum of a case of tuberculous broncho-pneumonia. The sputum contained numerous tubercle bacilli. The remaining two strains were isolated, one from the sputum of a case of chronic bronchitis, the other from a case of post-anæsthetic broncho-pneumonia, who subsequently died. This case, No. 174, developed an empyema.

Sub-group 5073: Two Cases.—The standard strain, No. 126, Table III., was obtained from the cerebro-spinal fluid of a boy who fell from a bicycle, fractured his skull, and developed a pneumococcal meningitis. In this case the pneumococcus failed to lyse in 2 per cent. bile-salt until sub-cultured several times. The second example of this sub-group was isolated from the pus of an empyema.

Sub-group Eccles: One Case.—This organism was isolated from the sputum of a case of chronic bronchitis, and so far no further examples of this sub-group have been isolated.

Unclassified Pneumococci Type IV. Rockefeller.

In Table IV. the remaining 16 strains of pneumococci are set out, which were not grouped by any of the anti-pneumococcal serums used during this work. One case, No. 120, Table IV., a child of 4 months was admitted to hospital with an abscess on the back of the hand which had been present for six days. The child had a high temperature, and had developed signs of meningitis. The cerebro-spinal fluid contained pus and pneumococci, and the blood culture was positive, enormous numbers of cocci being present in a 12-hour culture. A thick blood film contained several groups of pneumococci. The child died 10 days after the abscess of the hand developed, but no antibodies were present in the blood serum. This was the only death amongst the 16 cases in this group. Four cases of lobar pneumonia, 2 of which developed empyema, 1 of broncho-pneumonia, 6 of bronchitis, and 4 of common cold are present in this collection of unclassified pneumococci.

From a survey of these serological groups of pneumococci one finds that of the 77 cases examined 47 are members of Lister's A, B, or C groups—i.e., Types I. and II. Rockefeller, with the addition of the A group; and 30 cases belong to the heterogeneous collection Type IV., none of which were found to be similar to Lister's F, G, J, or K groups. Taking the

incidence of cases of serious pneumococcal infections as lobar pneumonia, broncho-pneumonia, meningitis, and septicæmia occurring in the A, B, and C infections, 35, or 72 per cent., fall into this category, the remaining infections being of a milder type—bronchitis, cold, asthma, &c. Lister's figures (1917), noted above, place some 70 per cent. of his cases of lobar pneumonia in Types A, B, C, and E, and Cole (1913) places some 70 per cent. of his pneumonia cases in Types I., II., and III. The figures for the three areas would appear therefore to be somewhat similar, Types I. and II. pneumococci being frequently present in serious pneumococcal infections in this country. On an examination of the Type IV. infections, 12, or 40 per cent., are of a serious nature and 60 per cent. more mild. Thus, although over half the cases from which this type of coccus was isolated are mild, these cocci are capable of producing any of the serious forms of infection, meningitis, lobar pneumonia, and broncho-pneumonia—instances having appeared in the list of cases examined above—but do not produce these serious forms of infection in such a high percentage as the Types I. and II. pneumococci.

Conclusions.

1. That from the laboratory methods employed the pneumococcus presents its most typical appearance in fresh body exudates, and that bile solubility and the absence of hæmolytic activity are almost constant characteristics of the pneumococcus.
2. That for the separation of pneumococci in sputum and pus, Dudgeon's method is a convenient and satisfactory one.
3. That the fermentation reactions of the pneumococcus are of no value for the division of the organisms into types.
4. That pneumococcal antibodies corresponding to the type of pneumococcus responsible for the infection, though not present in the early stages of the disease, are usually formed in the post-critical blood serum of cases of lobar pneumonia, and in the later stages of some other pneumococcal infections.
5. That the pneumococci responsible for lobar pneumonia and other serious pneumococcal infections in this country are similar to those found in America and South Africa.
6. That Type IV. pneumococci are capable of producing any of the serious infections due more commonly to Types I. and II. infections.

I have to thank Sir Frederick Lister for his kindness in forwarding the standard strains of pneumococci which formed the basis of this work. I am also greatly indebted to Prof. L. S. Dudgeon for much kindly help and advice, and to the members of the staff of St. Thomas's Hospital for permission to obtain material from their cases, and for the use of their clinical notes.

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THE IMPORTANCE OF THORACIC RESPIRATION.

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MY object in writing this paper is to call attention to the very important part played by thoracic respiration at all periods of life; to the necessity of observing its extent; to the recognition of the factors that affect it prejudicially; and to the consideration of the best mode of dealing with it and with the conditions which impair its efficiency.

When I was working at the changes which the skeleton and soft parts of the labourer undergo in consequence of an arduous occupation my attention was called to the function of the intercostal muscles, the share they take in the respiratory process, and the modifications they undergo in the various types of workmen. At that time the mechanics of the respiratory process were, like all the mechanics of the skeleton, described in a most crude and superficial manner. The action of the intercostal muscles was illustrated in the text-books of physiology by a vertical rigid rod representing the spinal column, and attached to this rod by hinges were parallel bars representing the ribs, and to these bars pins were fixed at intervals. The supposed action of the internal and external intercostal muscles was demonstrated by attaching to these pins elastic bands having the direction of the fibres of these muscles. As a result of this representation it was stated that the external intercostal muscles raised the ribs, and were consequently inspiratory muscles, while the internal intercostal muscles depressed the ribs and were expiratory in their action.

Free Movement of Vertebral Segments.

The fallacy in this experiment lies in the fact that far from being a rigid body the vertebral segments which make up the dorsal spine move very freely on one another around a transverse axis in an antero-posterior vertical plane. Indeed, on observing an individual passing from extreme inspiration to extreme expiration the alteration in the curve of the spinal column is a more marked feature than the elevation and depression of the costal arches. The vertebræ, instead of forming a rigid rod, are freely mobile in an antero-posterior plane. The sternum affords the fixed bar, while the elasticity of the costal cartilages permits of its depression and elevation. This is demonstrated by a change that takes place in the first costal cartilage of the labourer under the influence of great pressure. In consequence of this strain a process of ossification commences in the periphery of each extremity of the first costal cartilage, and gradually extends till the whole cartilage has been converted into bone. To meet the flexion of the spine and the consequent movement of the vertebræ in an antero-posterior plane a new joint develops in the ossifying cartilage. This is at first purely amphiarthrodial in type, but when fully developed it forms an arthrodial joint which allows of very free movement between the segments of the ossified cartilage, one of which is continuous with, and inseparable anatomically from, the first rib, and the other forms a part of the manubrium.[1] Figs. 1, 2, 3, and 4 represent several of the stages in the development of this joint.

Curiously enough, the physiologist makes no mention of the very obvious movement of the vertebræ in an antero-posterior plane. I have looked up the mechanics of respiration in an excellent text-book of physiology,[2] and find that the same diagrams are still employed to illustrate them, and that "the

[1] Some points in the physiology and pathology of the changes produced by pressure in the bony skeleton of the trunk and shoulder-girdle, Guy's Hospital Reports, 1886.
[2] Starling: Elements of Human Physiology.

external intercostal muscles, which shorten and so raise the ribs," are regarded as inspiratory muscles, and that "the internal intercostals depress the ribs and act as expiratory muscles." I would point out that the direction of the fibres of the external intercostals is continuous with that of the external abdominal oblique, a powerful muscle of expiration and a flexor of the thorax, dorsal and lumbar spine, while the reverse is true of the internal abdominal oblique, whose fibres continue the direction of the internal intercostals.

My observations on the anatomy of the labourer showed beyond a shadow of doubt in my mind that the internal intercostal muscles are the most powerful extensors of the dorsal spine, and are the chief

Showing Four Stages in Joint Development.

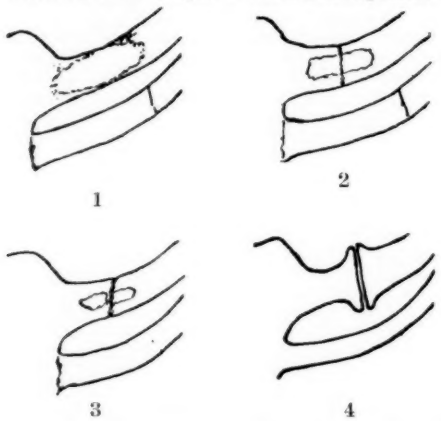

FIG. 1 shows the gradual formation of bone in the periphery of the extremities of the first costal cartilage.

FIG. 2 shows an extension of this process and a transverse marking in the bony sheath and residual core of cartilage, where the cells have arranged themselves at right angles to the long axis of the cartilage, and have elongated and formed fibrous tissue.

FIG. 3 shows a more advanced stage, the fibrillation having extended through the whole breadth of the cartilage, forming an amphiarthrodial joint.

FIG. 4 shows the fully developed arthrodial joint, the opposing surfaces of which exceed in area that of the normal cartilage.

muscles of thoracic inspiration. Their function is to extend the bodies of the several vertebræ upon one another, and to raise the ribs and sternum correspondingly. I also demonstrated that the external intercostals are the most powerful flexors of the dorsal spine, flexing the dorsal vertebræ upon one another and depressing the costal arches and sternum correspondingly. In extreme inspiration the dorsal spine is extended to its utmost, while in extreme expiration it occupies a position of extreme flexion. The normal respiratory effort moves within a varying degree between these extreme limits.

The "Intercostal Ligament."

In such a labourer as the coal-heaver, who carries loads on his back, the constant strain on the internal intercostal muscles in opposing the forward displacement of the upper dorsal vertebræ—more especially the first and second—results in the formation of a very dense layer of ligamentous material which lies internal to the internal intercostals and continues the direction of its fibres. It extends from the posterior three-fourths of the first rib downwards and backwards through the subjacent spaces in a continuous plane to the spine. It is clearly a retrocession of the deeper part of the internal intercostal muscle, and it serves to diminish the expenditure of energy by this muscle. As I had seen no reference to this structure in works on anatomy I called it "the intercostal ligament." It affords an excellent example of labour economy, while at the same time it demonstrates the action of both internal and external intercostal muscles. This ligament and the mode of development of the joint in the ossifying first costal cartilage are fully described in the paper in the Guy's Hospital Reports for 1886. It is quite clear that diaphragmatic—or, as it is commonly called, abdominal—respiration is a more perfect reflex than is thoracic respiration. This is due to the fact that the action of the diaphragm is essential to life and makes no apparent demand upon the energy of the individual. The increase in the capacity of the chest, which is effected chiefly by the action of the internal intercostal muscles and the consequent change of posture of the individual, involve an expenditure of energy which is proportionate to the extent of the effort. Any condition that lowers the vitality of the individual, or which, in other words, reduces the capacity to expend energy, diminishes the degree of thoracic respiration. The factor that most frequently effects this is intestinal auto-intoxication, and this is exceedingly common, if not to some extent almost universal, in civilised communities.

Variation in the Respiratory Act in the Two Sexes.

Following up the question of respiration I studied the differences of the respiratory act in the male and female, and found that while the anatomist had regarded the pelvic bones as alone presenting distinctive characteristics, that the thorax of the female differs from that of the male in an even more obvious manner.[3] The variations presented by the female thorax are due to the fact that the abdomen, and indeed a portion of the thorax, have to accommodate the pregnant uterus for a certain period of time. This by its bulk interferes with the free descent of the diaphragm and impairs the entry of air into the lower segment of the thorax. To meet this temporary condition the respiratory capacity of the upper portion of the thorax must be increased. This is effected in a very simple manner. The sternum of the female is relatively shorter than that of the male. To it are attached seven and often six cartilages; in the male seven, and often eight, articulate with this bone. While this arrangement reduces the strength of the individual it renders the lower segments of the thorax more mobile and facilitates their separation by the pregnant uterus. While the whole sternum of the female is relatively shorter than it is in the male, the manubrium bears a very disproportionate relationship to the gladiolus, the latter being less than twice as long as the manubrium. In the male the manubrium is relatively small, while the gladiolus is always more than twice its length. Here, again, the woman sacrifices strength in order to enable her to perform her reproductive function. On the other hand, the upper costal arches are relatively much larger in the female, and owing to the greater length of the manubrium the first intercostal space is correspondingly deeper than in the male. By this arrangement she is enabled to aerate her blood sufficiently in the upper portion of her thorax when abdominal and lower thoracic respiration are hampered by her pregnancy.

Relation of Respiration to Vitality.

I cannot illustrate the importance of the bearing of the respiratory function on body growth and general vitality better than by giving the results of efficient respiratory exercises extending over a period of four months. The subject was a delicate child, whose respiration normally was entirely abdominal and whose pharynx showed marked adenoid growth. The following table represents measurements of the chest at the nipple level in its inspiratory and expiratory limits. These figures show that in four weeks the measurement on extreme inspiration showed an increase of 4 in., the expiratory limit remaining the same, while the weight had gone up 9½ lb. Three months later the inspiratory limit was 36 in., the expiratory had increased to 29½ in., and the weight was 9 st. 4 lb.;

[3] What are the chief factors which determine the differences which exist in the form of the male and female pelves? Trans. Obst. Soc., 1888.

moreover, all objective evidence of adenoid growth had disappeared. Such an improvement could not have been effected without constant care and attention on the part of the highly trained nurse who carried out the treatment.

—	Inspiration.	Expiration.	Weight.	—	Inspiration.	Expiration.	Weight.
Feb.				Feb.			
1st	30 in.	28½ in.	7 st. 12 lb.	15th	32½ in.	28½ in.	8 st. 2½ lb.
2nd	30½ ,,	,,	—	16th	32½ ,,	,,	—
3rd	31 ,,	,,	—	17th	33 ,,	,,	—
4th	31½ ,,	,,	—	18th	33 ,,	,,	—
5th	31½ ,,	,,	—	19th	33 ,,	,,	—
6th	31 ,,	,,	—	20th	33 ,,	,,	—
7th	32 ,,	,,	—	21st	33 ,,	,,	—
8th	32 ,,	,,	7 st. 13 lb.	22nd	33½ ,,	,,	8 st. 5 lb.
9th	32 ,,	,,	—	23rd	33½ ,,	,,	—
10th	32½ ,,	,,	—	24th	33½ ,,	,,	—
11th	32½ ,,	,,	—	25th	33½ ,,	,,	—
12th	32½ ,,	,,	—	26th	33½ ,,	,,	—
13th	32½ ,,	,,	—	27th	33½ ,,	,,	—
14th	32½ ,,	,,	—	28th	34 ,,	,,	8 st. 7½ lb.

In 1896 [4] and subsequently I published several papers on the importance of improving the respiratory capacity of feeble children, and particularly those who were the subjects of adenoid hypertrophy with or without operation, and to my surprise my suggestions met with violent opposition. Sir Felix Semon, the then recognised authority on laryngology, devoted three and a half columns of a lecture, which was published in the *British Medical Journal*,[5] to show that my views on the supposed benefits to be derived from respiratory exercises were ridiculous. To give an idea of the antagonism that the employment of breathing exercises aroused, I quote a few lines from the lecture of this distinguished surgeon. "Well, gentlemen, I may be an incurable sceptic, but I have no hesitation in telling you that I do not believe for a moment that a single child which has got well-marked adenoids has been, or ever will be, cured by breathing exercises, all reports to the contrary notwithstanding. I mean no disrespect to Mr. Arbuthnot Lane, but I cannot help saying the whole idea seems to me preposterous"; and again: "If it should be called unscientific to say plainly that the rationale of his treatment was a mystery to them, I, for one, must plead guilty to the soft impeachment. How a genuine lymphoid hypertrophy can ever be expected to be dispersed by breathing exercises completely passes my understanding."

It would be interesting to compare the views Sir Felix Semon then enunciated on the value of respiratory exercises with those now held by laryngologists, by medical men generally, and even by school teachers and the better educated part of the public. It was not till later that I realised the important influence that intestinal auto-intoxication and chronic intestinal stasis exert upon the respiratory and other functions of the body and how far they are responsible for the development of diseases.

In 1902 I opened a discussion[6] on the subject at a meeting of the British Medical Association in Manchester, when there was much difference of opinion, though the ideas which were expressed by the several speakers, notably by Dr. Harry Campbell, showed that a change of view was taking place with regard to the mechanics and affections of the naso-pharynx.

Stasis as the Chief Cause of Lowered Vitality.

Intestinal stasis develops at an early period in the lifetime of the child. While the infant wears napkins it passes its motion when the bowel recognises the desire to evacuate it. When the napkin is discarded the child is taught to retain the products of 24 hours' digestion in the large bowel, with the result that the pelvic colon elongates and secondary changes ensue. Sooner or later the contents of the small intestine become infected by organisms and the food-supply is contaminated. This results in a poisoning of all the tissues and organs of the body, rendering them unable to perform their functions in a normal manner and reducing their capacity to resist the inroad of micro-organisms. The observation of a large number of delicate children shows that in them thoracic respiration is in abeyance, and that a tape encircling the chest undergoes no variation whatever during respiration. The tissue in the infant in which the earliest evidence of infection by organisms is observed is the lymphoid tissue in the naso-pharynx. Later in life the evidences of lowered resisting power are shown in an infection of the periodontal membrane to which the name of pyorrhœa has been given. Both these conditions, which are secondary to stasis, are regarded by many as diseases appearing spontaneously and being themselves causes of stasis and its results. As age advances the amount of energy which can be expended in effecting thoracic respiration diminishes, and the chest and dorsal spine assume the curves that one associates with that time of life. Perhaps most of this is due to the fact that stasis increases with age, and that it is the prime factor in producing disease and death. Again, a great deal of defective thoracic respiration is due to habit, the individual neglecting to keep his chest working efficiently. Besides being very deforming it serves to diminish the oxygenation of the blood and to hasten degenerative processes throughout the body.

A recognition of the facts to which I have called attention in this paper must impress the reader with the importance to the individual of keeping the function of thoracic respiration in an efficient condition, even though little consideration is given to the state of the muscular system generally; also that chronic intestinal stasis, that dread accompaniment of civilisation, should be met by every possible means if the tissues of the body are to be kept in the best possible condition.

[4] Some Experiences in the Surgical Out-patients' Room of a Children's Hospital, Clinical Journal, 1896.
[5] Local Treatment of the Upper Air-passages, Brit. Med. Jour., Nov. 2nd, 1901.
[6] Respiratory Exercises in Naso-pharyngeal Lesions, Brit. Med. Jour., Sept. 6th, 1902.

THE RATIONALE OF THE WASSERMANN REACTION.

An Abridged Account of a Paper Read Before the Dermatological Section of the Royal Society of Medicine on Oct. 20th, 1921,

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THOUGH the Wassermann reaction (W.R.) has been extensively employed since 1907, it cannot be said that much progress has been made in unravelling its modus operandi. Some have laid great stress upon the possible interpretations of a positive and negative reaction, but those with a large clinical experience are coming to the conclusion, that a negative reaction signifies nothing, and that a positive reaction means no more than that the patient has had syphilis. It is now being recognised that the reaction can be used, neither as a regulator of treatment nor as a test of cure, and that a positive reaction does not necessarily signify that the disease is active and that the patient requires treatment. Though the experimental work about to be described will form sufficient proof of the statements just enunciated, the main object of this paper is to detail as far as is possible the changes undergone by the protein particles in syphilis, and to throw more light on certain problems which so far have remained unsolved. Before doing this it will be necessary to consider the hæmolytic system, the foundation of all complement-fixation tests, and to point out the relationship it bears to the first part of the W.R.

Hæmolytic System.

An immune serum plus complement will cause red blood corpuscles to give up their hæmoglobin, and

produce what is called hæmolysis. If the serum immunised against the red blood corpuscles, and known as amboceptor, is not inactivated there is no need to employ the fresh serum of another animal, which receives the name of complement. Inactivation causes equal-sized protein particles to agglomerate partially, an action which always leads to a reduction of their Brownian movement, and may lead to a precipitation of some of the clumps formed. In the presence of antigen—that is to say, the substance with which the immunisation is carried out—the immune serum when used fresh and unheated will undergo similar changes, only more slowly, which is likewise the case when the serum is heated and complement is used. While these changes are taking place the surface-tension of the liquid medium is diminished, with the result that the red blood corpuscles give up their hæmoglobin. A specific amboceptor is not essential, because a simple negatively or positively charged colloid will take its place. Either colloidal silicic acid or colloidal aluminium hydroxide will replace the amboceptor. If the two are used together no hæmolysis results, because the iso-electric point is reached. There will also be no hæmolysis if one of the colloids is allowed to interact with the complement some time before the red blood corpuscles are added, because precipitation is the final stage of adsorption, agglomeration, &c., and when precipitation is complete, the normal surface-tension of the liquid medium becomes restored; consequently the added red blood corpuscles simply fall by their own weight to the bottom of the tube. The fresh serum of a guinea-pig is employed for the complement. In such a serum the protein particles are uniform in size and show vigorous Brownian movement. With colloidal silicic acid the particles decrease in number and rapidly form clumps, which finally become precipitated. During the stage of spontaneous condensation brought about by an increased positive charge, which in turn is produced on the surface of the particles by the non-metallic condenser, there occurs a diminution of the surface-tension, which causes hæmolysis of red blood corpuscles, if the latter are added before the surface-tension has rectified itself. Condensation leads to precipitation, which rights the surface-tension. The metallic conductor (aluminium hydroxide) causes the particles to increase in number and size and then to form small agglomerations. Condensation and final precipitation is the result, though the changes are slower in occurring. The metal causes condensation because the protein particles undergo a change to compensate for the dissipation of electrons and for the loss of certain electrolytes, while the non-metal causes condensation because from the start it leads to a conservation of the negative electricity. It is clear that hæmolysis is a surface-tension phenomenon, and that complement represents the normal electrification of the surface of the protein particles. Complex colloidal metals and non-metals will not act as amboceptor, because their action on the surface of the protein particles penetrates to the mass, and when this occurs precipitation is too rapid to register an alteration in surface-tension.

First Part of the Wassermann Reaction.

This is akin to the non-specific hæmolytic system, in which the protein particles constituting the complement, are precipitated before the red blood corpuscles are added. The patient's serum altered by inactivation and by the disease, adsorbs the antigen and tries to regain its normal state of emulsion at the expense of the complement. Failure to do so results in precipitation with consequent destruction of the complement, hence the amboceptor and red blood corpuscles, when they are added, also become precipitated—a positive W.R. A multitude of substances will act as antigen, and all capable of so acting have a common property in that they lower the surface-tension of the liquid medium in which the patient's protein particles are in true emulsion, and cause agglomeration and precipitation of the particles themselves.

Production of a Positive Complement-Fixation Test in Vivo.

If a single sub-lethal dose of an unprotected metal (Al > Zn > Bi > Hg > Fe > Cu > Ag) in the colloidal state is injected intravenously into a rabbit it makes the serum give a positive complement-fixation test (C.F.T.). Under the ultra-microscope the particles in such a serum are increased in number and a few are increased in size. The picture given resembles that of an early syphilitic serum, that of a serum to which a trace of alkali has been added, and that obtained at the negative pole when a current is passed through a serum film. If a lethal dose is injected the C.F.T. may be positive, negative, or anti-complementary, the result being largely influenced by the particular metal. There is a diminution in the number of the particles, a marked increase in size and clumping with actual precipitation. A similar picture is given by certain late syphilitic serums. If several injections of small doses are prescribed the serum gives a negative reaction, which usually becomes anti-complementary when too many are made; this is exactly what may happen in an early case of syphilis over-treated with arseno-benzene. Furthermore, the ultra-microscopic pictures obtained in both are identical—namely, marked diminution in the number of the particles, a few giant particles and clumps which evince a ready inclination to become precipitated.

If a single sub-lethal dose of a corresponding non-metal (belonging to the sulphur group of elements S, Se, & Te) is injected, the serum remains negative. If a lethal dose is injected the serum gives a positive C.F.T. and an ultra-microscopic picture similar to that obtained when a serum is treated with an acid, and to the picture witnessed at the positive pole when a current is first passed through a serum film. The particles are diminished in number and many agglomerations are formed, which in some instances are precipitated in masses. If several small doses are injected the serum becomes strongly positive with some preparations and anti-complementary with others, and the ultra-microscopic picture obtained is indistinguishable from that given by certain late syphilitic serums. Furthermore, the ultra-microscopic picture cannot be differentiated from that obtained with a serum changed by a metal, by a serum treated with an alkali, and by a serum at the negative pole during the passage of an electric current. The sequelæ of injecting a metal run, I believe, as follows. When the dose is sub-lethal the conductor effect of the metal causes the protein particles to discharge some of their electrons in the form of both electricity and heat. This would tend to increase the positive charge on their surface, a state of affairs which is incompatible with life. The amphoteric nature of the protein comes to the rescue and the "baseness" of the particles in increased.

This is the phenomenon of spontaneous condensation. Such a change makes the particles adsorb antigen and they readily go for complement with the hope of extracting therefrom the negative electricity they themselves have dissipated. This results in agglomeration and precipitation of all three and consequently a positive C.F.T. When a lethal dose is employed the discharge of negative electricity and increase of "baseness" may so affect the surface and mass as to render the particles incapable of adsorbing other particles, or as to augment their desire to recover their normal state to such a degree, that they are able completely to precipitate the complement particles without the assistance of the antigen, and give what is called an anti-complementary reaction. An anti-complementary reaction is the half-way house between a strong positive reaction and a negative reaction, because the C.F.T., like all colloidal reactions, is of a cyclical nature. When several small doses are injected the particles become dispersed and go into true solution, in which state they no longer act as colloids. Conversion into the molecular-dispersoid state is possible with a liquid-in-liquid colloidal system,

to which protein belongs, but it is a forced and not a spontaneous process.

On the other hand, a non-metal, acting as a condenser, at first diminishes the electronic activity of the protein particles, no electrons being discharged. When a lethal dose and several small doses are prescribed, the conservation of electrons, with the resulting increase of hydrogen on the surface, cause the particles to increase their "baseness." Such a step leads to an increased avidity for electrons, which the complement added cannot satisfy, consequently a positive C.F.T. is obtained. If my reasoning is correct the injection of a non-metal or condenser should return a positive reaction produced by a metal or conductor to a negative reaction, and cause the serum to give an ultra-microscopic picture indistinguishable from the normal. Not only is this what happens but the converse is also true. Though the reaction may be reduced to negative if previously positive, or to positive if previously negative, when a single injection of a metal is administered after several injections of a non-metal and vice versâ the ultra-microscopic pictures remain unaltered. This is likewise the case in late syphilis, and shows that once the particles have been accustomed, so to speak, to accommodate themselves to the altered conditions, they continue to perpetuate the changes, irrespective of the drugs prescribed. Consequently one cannot surmise from a given reaction in syphilis how the causative organism is behaving.

Effect of Metals and Non-Metals on Syphilitic Serums.

In early syphilis metals first increase the positivity of the C.F.T. because the initial stage of dispersion is accompanied by marked electronic activity. In the late stage of dispersion the reaction becomes negative, and occasionally the injection of a non-metal will re-convert it into a positive. Non-metals alone cause an immediate diminution of the positivity with an aggravation of the clinical signs, but their continued administration leads to a degree of positive reaction, which can be reduced only by the employment of metals. In late syphilis, if the reaction is negative to start with, a non-metal acts as a better provocateur of a positive reaction than a metal. If positive to start with, a non-metal will render the C.F.T. temporarily negative quicker than will a metal.

Changes Undergone by the Serum in Syphilis.

The protein particles undergo three main changes: (1) increase in number; (2) surface change; (3) mass change.

Increase in Number.—This change is most noticeable in early syphilis and can be detected before the C.F.T. is positive, but any manœuvre which sets in motion the spontaneous process of condensation will cause the same to give a positive reaction. This can be achieved by shaking with insoluble substances, such as barium sulphate, tin oxide, bismuth subnitrate, &c. Occasionally in late syphilis an increase in number is to be observed, but in such cases the C.F.T. is always negative and does not change into positive on the administration of a non-metal. These particles are albumin particles which always nullify, if in sufficient quantity, a positive reaction given by globulin particles. They are caused by a conversion of lipoid-globulin into albumin, and all the cases I have investigated had a marked degree of hyperpiesis. Whether the hypertension is due primarily to the increased viscosity of the serum or to the reduction in the surface electrification of the protein particles I cannot at present determine. I am strongly of the opinion that the changes in the vessel walls and kidneys are secondary to those in the serum.

Surface Change.—The protein particles in syphilis contain more electrolytes than normal; they are therefore capable of greater electronic activity. The discharge of electrons—i.e., the oxidising action of the particles—in the form of electricity and heat to overcome the parasites results in a condensation of the particles and in an increase of their "baseness."

As the disease advances and the electronic activity is continued, the particles lose many of their surface electrolytes. This increases their power of adsorption, which in vitro is measured by precipitation; consequently the most positive serums are usually late syphilitic serums. This being the fact at the stage when there are fewer organisms, again supports the view expressed that there is no parallel between the two. When the loss of electrolytes is exactly counterbalanced by the mass change, the lipoid-globulin so formed reaches its iso-electric point. At this point protein is, so to speak, dead and is excreted into the urine and into the general peritoneal cavity. This protein when collected invariably gives a negative C.F.T. Electronic activity resulting in condensation and increase of "baseness" imparts to particles so altered the chemical and physical properties of globulin. A continuation of the same leads to the formation of lipoid-globulin, which in its turn may be converted into albumin. The changes through which protein can pass are likewise cyclical in nature: Albumin —> globulin —> lipoid-globulin —> albumin.

Mass Change.—Apart from changes already observed, the mass exhibits an increase of amino-groups in early syphilis and an increase of lipoid material in late syphilis. The former is proved by Van Slykes's estimation of amino-nitrogen, and the latter is suggested by the behaviour of certain compounds on normal protein particles, by ultra-microscopic examinations, and by the effect produced on serums by the passage of electric currents. Lipoid-globulin can be formed at the negative pole and by shaking a serum with α-naphthylamine. Sometimes ringed particles are formed which in turn, on continued passage of the current, become converted into sheaf-shaped crystalloid bodies, which at present I take to be the glyceryl-esters of the higher fatty acids. Summed up the position is as follows:—

When the increase of electrolytes bears the same ratio to the amino-groups as occurs normally, the C.F.T. is negative. When the electrolytes become dissipated and the protein mass has to undergo changes to compensate for the loss, the C.F.T. is positive, because the adsorptive capacity of the particles is increased with the hope of being able to take from the particles added the electrolytes necessary to restore the balance. When the loss of electrolytes is just balanced by the substantive changes the C.F.T. is negative. When the electrolytes are still further destroyed, the C.F.T. is anti-complementary, because nothing added can restore the balance; in fact, anything added only furthers the precipitation. This stage corresponds to that produced when a normal organ is extracted with alcohol or acetone.

Thus we are now able to visualise the exact action of antigen. In fact, certain protein particles when rendered anti-complementary will serve as the antigen. A W.R. can actually be undertaken with ingredients made from the patient's own blood with the sole addition of some colloidal silicic acid for use as the amboceptor. A serum can be rendered anti-complementary by shaking with naphthalene, α-naphthol, and α-naphthylamine. If the serum is filtered, dried, and dissolved in saline, only the one treated with α-naphthylamine will act as antigen. α-Naphthylamine converts the protein particles into lipoid-globulin, diminishes the surface-tension, and diminishes the viscosity of the liquid medium. Further, it causes marked agglomeration and condensation of the protein particles. In other words, it imparts to the protein particles those characters upon which we have seen the C.F.T. depends. A like degree of agglomeration and condensation occurs normally in the serum of most pregnant women. This explains why at least 10 per cent. of non-syphilitic women when they are pregnant give a positive C.F.T., and why many syphilitic women (except those recently infected) give a negative C.F.T. From the foregoing we can also understand why repeated freezing and thawing, exposure to alterations of atmospheric pressure and to radio-active bodies, and shaking with various non-electrolytic substances, tend to make a normal serum give a positive or anti-complementary reaction. They make a slightly positive serum more positive

and a strong positive serum either negative or anti-complementary. Practically speaking, any factor which causes the condensation of the protein particles may make a normal serum, and an early and late syphilitic serum behave as just described. It further-more renders the protein particles more stable, a phenomenon which accounts for the facts, that a late syphilitic serum after the ingestion of alcohol is apt to give a negative C.F.T.; that the addition of sodium citrate fails to check coagulation; and that shock is prevented from following a second and what would ordinarily have been a lethal dose. The whole story is really that of a combat on the part of the protein particles—one of condensation versus dispersion.

Finally, I think we may conclude that a negative C.F.T. does not exclude syphilis, and that a positive C.F.T. means no more than that presumably the patient has had the disease.

THE SACHS-GEORGI REACTION IN SYPHILIS.

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THE very interesting contributions by Dr. A. Neave Kingsbury[1] and Dr. C. C. Okell[2] to the above subject have prompted me to present the following figures based on a comparative study of 500 serums submitted to the Wassermann (W.R.) and Sachs-Georgi (S.G.) reactions.

Method.—The W.R. was performed by Harrison's method, the S.G. in the simplest manner possible. Only one tube was used for each serum tested. The antigen was the same as employed in the W.R.—namely, three parts of a suitably diluted alcoholic extract of human heart muscle reinforced with two parts of a 1 per cent. alcoholic solution of cholesterin. The only difference was in the manner of adding the saline. For the W.R. the addition was made rapidly as recommended by Harrison, for the other the addition was made slowly. The opacity of the resultant emulsions varied accordingly. 0·3 c.cm. patient's serum was added to 1 c.cm. of antigen and the tube agitated to ensure complete mixing. The tubes were put in the ice-chest and readings were taken at 24 and 48-hour intervals. For practical purposes it was not found that the longer period produced any appreciable change in the appearance of the tubes, so that towards the end of the series the second reading was discontinued.

The serums used in the S.G. were quite unselected. During the investigation the number of specimens of blood submitted for the W.R. averaged 80. Considerations of time prevented the performance of both tests upon all each day but, as circumstances allowed, 20 to 40 were taken indiscriminately and tested as indicated above. It will be realised that by this means all circumstances governing the components of each test were exactly comparable. As the question of the use of inactivated as against uninactivated serum appeared to be at issue, 250 were tested with heated and 250 with unheated serum. Analysis of the results obtained in each instance did not provide sufficient data to warrant a definite pronouncement regarding the matter. It was, therefore, decided to combine all the results and present them as a record of a series.

TABLE I.

Total	S.G.+ W.R.+	S.G.− W.R.−	S.G.+ W.R.−	S.G.− W.R.+
500	206	199	52	43

Total agreement 81 per cent.

For simplicity of reference and for purposes of comparison I have taken the liberty (which I hereby acknowledge) of substituting my figures in the table so simply and effectively made out by Dr. Okell.

Apart from satisfying myself as to the comparative merits of the tests I was further interested to learn something of the respective values of each in varying clinical stages of syphilis. It must be understood that I was not responsible for the diagnoses. I accepted the statement of the practitioners submitting the specimens. In Table II. I have attempted to show

TABLE II.

Symptoms.	Total.	S.G.	H.M.§	S.G. per cent.	H.M.§ per cent.
O.C.T.* ..	31 (7 / 11 / 13)	− / − / +	+ + / + / −	41·9	58·1
Primary ..	7 (1 / 1 / 5)	− / − / +	+ + / + / −	71·4	28·6
Secondary ..	8 (1 / 2 / 5)	− / − / +	+ + / + / −	62·5	37·5
Tertiary ..	13 (1 / 2 / 10)	− / − / +	+ + / + / −	76·9	23·1
C.N.S.S.† ..	16 (2 / 3 / 11)	− / − / +	+ + / + / −	68·7	31·3
C.S.‡	4 (2 / 2)	− / +	+ / −	50	50
Gonorrhœa ..	8 (1 / 3 / 4)	− / − / +	+ + / + / −	50	50
Syphilis in family	8 (2 / 4 / 2)	− / − / +	+ + / + / −	25	75

* Old case treated. † Central nervous system syphilis.
‡ Congenital syphilis.
§ Wassermann reaction, Harrison's method.

how the 95 disagreements in the series were related to the specified stage of the disease. It will be seen that the S.G. gave a greater percentage of positive readings in primary, secondary, tertiary, and central nervous system syphilis; the W.R. in old treated cases and familial syphilis; whilst the results balanced in congenital syphilis and in gonorrhœal cases. Under the conditions of experiment outlined it appeared that, unlike Dr. Okell, with a negative W.R. the S.G. was not so seldom positive as to enable me to confirm his opinion that "where the Sachs-Georgi was used in place of the Wassermann only a small percentage of patients would be unnecessarily submitted to treatment."[2] I had not viewed the S.G. in this light as, judging from most of the clinical histories provided, I came to the conclusion that the S.G. was more delicate, especially in primary and early secondary syphilis. Such a point, however, I would not be inclined to strain as it is based upon a relatively small number of cases. I have no doubt that the more complicated modifications indicated by Dr. Okell were responsible for his excellent percentage agreements, but it appeared of interest to record that satisfactory figures were obtainable in the extremely simple manner indicated. After all, the ideal longed for by every worker in this branch of serology is simplicity, and substitution tests are only attractive the more nearly they approach to that ideal. From a purely practical point of view, one wonders what advantage alternative tests have over the Wassermann reaction. Greater specificity has not yet been proved for them and their introduction into routine work merely serves to cause confusion.

I am indebted to Dr. R. M. Buchanan, city bacteriologist, who afforded me every facility in carrying out the work, and to Miss D. L. Young who assisted me throughout the investigation.

[1] THE LANCET, Oct. 15th, 1921, p. 799.
[2] Ibid., Nov. 5th, 1921, p. 962.

GENERAL PRACTITIONERS AND MIDWIVES.—The Ministry of Health will shortly hold a conference with the County Councils' Association on points arising out of the scale of fees payable to medical practitioners under Section 14 of the Midwives Act, 1918. The London County Council has been invited to send representatives and has decided that the members of its Midwives Acts Committee shall attend.

TUMOUR OF THE RIGHT PETROUS BONE.

BY THOMAS ANWYL-DAVIES, M.B., B.S. LOND., M.R.C.S.

THE following case of tumour of the right petrous bone is of sufficient interest to merit a detailed description. The case was under the care of Dr. Hector Mackenzie, at St. Thomas's Hospital.

The patient, a baker of 47, was admitted to St. Thomas's Hospital with no family history of cancer, tubercle, or serious illnesses, a negative Wassermann reaction, and a denial of specific disease. Ten months previously all teeth were removed as the patient was run down; the doctor then discovered a lump in the right side of the neck near the angle of the jaw. This lump continued to grow, and the patient had pain below the right ear, which gradually extended upwards to the right side of the scalp and on to the right side of the forehead. About a month before examination he was troubled with diplopia; then the right eyelid began to droop, and three weeks later he was unable to open the eye. For a year he had been losing weight, and had had increasing deafness. When shaving he could not feel the razor on the right side, and when drinking the glass felt broken on that side. The patient had occasional headaches and slept badly owing to the tenderness of the scalp. There had been no vomiting, no noticeable weakness, no paræsthesia of the limbs, and nothing abnormal in his gait.

Examination.—The man appeared thin, not anæmic, and fairly cheerful. Right eye completely closed; obvious swelling in neck; skin smooth on right side of forehead; right angle of mouth drawn up owing to voluntary contraction of facial muscles round right eye. Temperature normal, pulse 72, and respiration 16. Heart and lungs: no signs of organic disease; urine normal. No apparent motor weakness in trunk and limbs, no sensory loss, no alteration of reflexes, no incoördination, astereognosis, dysdiadokokinesis, or ataxia.

Cranial Nerves.—First nerve: On testing with oil of turpentine, peppermint, and asafœtida there was definite loss of sense of smell on right side. Second nerve: Visual acuity with the L. eye V. = $\frac{2}{3}$, and with the R. eye V. = $\frac{6}{6}$. No sign of optic neuritis. Third, fourth, and sixth nerves: On attempting to follow the finger only a slight downward and outward movement remained, with a wheel-like rotation inwards, indicating a slight action of the superior oblique muscle. Right pupil slightly larger than left and inactive to light. Fifth nerve, first division: Slight blunting of sensation on forehead; second and third divisions, patch of complete anæsthesia over lower half of right side of face. The border ran horizontally below right eye, sloped outwards to angle of jaw, and ran along lower margin of jaw to midline and upwards over the lips. Chorda tympani division: Loss of taste on right side of tongue to salt, sugar, and quinine. Motor division: Paralysis of masseter and temporal muscles on right side. Seventh nerve: No apparent facial weakness. Eighth nerve: A watch could be heard at distance of 1 ft. from left ear, but not at all with right ear. Bone and air conduction were both affected on right side. Ninth, tenth, and eleventh nerves: Some weakness of tensor palati on right side. Deglutition normal; no aphonia; trapezius muscle weak. Twelfth nerve: Tongue showed slight atrophy and weakness on right side.

Summary of Cranial Nerves.—Complete paralysis of third, fifth, sixth; partial paralysis of first, fourth, eighth, ninth, tenth, and eleventh. There was a hard gland about the size of an egg between angle of jaw and anterior border of sterno-mastoid on right side, and a chain of hard, small glands along anterior border of right trapezius. An enlarged gland could be felt on the left side of the neck, on the anterior border of the sterno-mastoid, about the size of a small gooseberry. Two or three tender spots on right side of scalp, but nothing could be felt underneath them.

Diagnosis.—Here was a man who for the last year had had gradual enlargement of glands in the right side of the neck, and gradual paralysis of most of the cranial nerves on that side—especially the third, fifth, and sixth. The glandular growth was superficial, and from its position could not be affecting the fifth nerve, much less the nerves supplying the eye muscles. Therefore, to account for the paralysis of the cranial nerves, we had to assume either some internal connexion with the external growth or two separate lesions—i.e., a glandular swelling in the neck and an independent affection of the cranial nerves. The fact that the paralysis of the cranial nerves had, like the external growth, been slowly progressive and was synchronous with it, pointed to an intimate relation between the two. Moreover, the external growth and the paralysis were on the same side, the inference being that the paralysis of the cranial nerves was due to a deep-seated growth, which could not be seen or felt.

Situation of Growth.—If intracranial, the growth had to be either in the medulla or at the cerebello-pontine angle, or rising from bone or dura mater. If extracranial, the growth had to consist of at least four parts—the first affecting the third nerve in the orbit or spheno-maxillary fissure; the second affecting the third division of the fifth nerve below the foramen ovale; the third affecting the eighth nerve; and the fourth part affecting the ninth, tenth, and eleventh nerves. This scattered distribution made a single growth much more likely. If the growth were situated inside the skull a comparatively small lesion could affect several nerves arising close together. If medullary, the centre of the growth was evidently near the nucleus of the fifth nerve, because the fifth was the first nerve affected, but for anatomical reasons a medullary growth was extremely improbable, and unsupported by clinical evidence such as interference with the centres controlling the heart, respiration, temperature, or sugar metabolism. Arguments against a tumour at the cerebello-pontine angle were: absence of headache, vomiting, and optic neuritis, and no signs of pressure on the cerebellum, such as nystagmus, ataxia, weakness, or giddiness, or on the pyramidal tracts; the seventh nerve had escaped, and the third nerve, which is not in this region, was affected. The remaining position involved the petrous portion of the temporal bone. The third, fourth, and sixth nerves are in close proximity to the apex of the petrous bone, and the fifth nerve crosses the ridge of the petrous bone just external to the apex. The uncus, which is part of the olfactory path to the brain, is also in this neighbourhood. The posterior surface of this bone is related to the seventh and eighth, and also the ninth, tenth, and eleventh cranial nerves. The hypoglossal nerve is at least one-third below. Hence a growth, at most 1 in. in length, extending backwards from the apex of the petrous bone may affect all the cranial nerves, except the second and twelfth. In this patient, only the second, seventh, and twelfth nerves had entirely escaped; the immunity of the seventh was probably due to its superior powers of resistance, and because it lies on the eighth nerve and is separated by it from the bone. Moreover, the facial nerve on the right side was hyperexcitable, which is a preliminary stage to final paralysis. The indications were that the growth began just posteriorly to the apex of the petrous bone, and involved the fifth nerve; that it first spread backwards, injuring the eighth, and then began its forward expansion, destroying the sixth and third nerves.

Nature of the Disease.—The growth probably started in the bone or the dura mater covering the bone. The commonest new growths arising in these tissues are sarcomata and carcinomata; gummata, enchondromata, fibroid growths, and hydatid cysts are much less common; gliomata and tuberculomata very rare. Hæmorrhage was excluded by the slow progressive course of the disease, and abscess by the absence of pyrexia. In favour of malignant disease were the presence of enlarged glands in the neck and their characteristics, especially those along the anterior border of the trapezius; the steady progressive enlargement of both the glands and the intracranial tumour, coupled with a certain amount of general wasting during the past 12 months. The relatively slow rate of progress favoured carcinoma, while intracranial growths involving a large number of nerves often turn out to be sarcomatous. In the absence of signs in the lungs or viscera the seat of the primary growth was probably in the skull in the position described, the glands in the neck being secondary to it, the onset of the disease being about 18 months before admission. The impairment of the sense of smell may have been due to direct pressure of the growth on the uncus, but more probably to atrophic condition of the mucous membrane of the nose owing to paralysis of the fifth nerve, and the olfactory end-organs may have shared in the general atrophy.

Treatment.—Surgical treatment was impossible owing to the position of the primary growth and the extent of the secondary glandular enlargement. Medicinal treatment offered no more hope of success. The only treatment possible was symptomatic. Aspirin and bromides relieved the headache, while morphia was not needed.

Prognosis.—One can only expect further involvement of nerves, especially of the first division of the fifth and of the seventh. The close proximity of the cavernous sinus to the anterior part of the growth is a grave source of danger, and ulceration into it would lead to thrombosis and rapid extension of the growth, terminating in early death.

I am indebted to Dr. Hector Mackenzie and to Dr. G. T. Hebert, of the tuberculosis department of St. Thomas's Hospital, for permission to publish, and for assistance in this unusual case.

Park-place, St. James's, S.W.

Medical Societies.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

AN ordinary meeting of this Society was held on Dec. 16th at 1, Upper Montague-street, London, W.C., Dr. HERBERT JONES (M.O.H., Herefordshire Combined Districts) being in the chair in the absence of the President, Dr. W. J. HOWARTH, who was absent through indisposition. Nineteen new members and seven associates were elected.

Surg. Rear-Admiral Sir PERCY W. BASSETT-SMITH delivered an address, as President of the Naval, Military, and Air Force Hygiene Group, on the

Development of Hygiene, Pathology, and Bacteriology in the Naval Medical Service,

in which he first gave a retrospect of the service. In 1692 barber-surgeons were appointed to the Navy, at first as "pressed men," and in 1704 surgeons in ships ranked with pilots and carpenters, being allowed as a favour to mess with warrant officers. In 1808 the senior medical officer alone messed in the wardroom. In those days hygiene was not of much account. Sir James Lind, senior physician of Haslar Hospital, was the pioneer of hygiene in the Navy, and his name would always be famous for his work in the prevention of scurvy, which he stated caused more deaths in the fleets than the French and Spanish arms. He recommended lemon-juice and sauerkraut, and introduced the distillation of sea-water, better ventilation and drying of ships, improved clothing and cleanliness, and fumigation with sulphur and arsenic. Next to Lind as a hygienist reformer came Sir Gilbert Blane, physician to the fleet (d. 1834), who strongly supported vaccination against small-pox. In 1801 89 naval surgeons presented Jenner with a gold medal, but vaccination was not made compulsory in the Navy until 1858. In 1827 Sir Wm. Burdett was medical director-general and instruction for medical officers was instituted. Dr. Scott founded the pathological museum at Haslar, and gave clinical lectures and instruction in the post-mortem room. This ceased in 1840, and the instruction of naval surgeons was not seriously taken in hand until 1871, when they were sent to the Army School at Netley. In 1881 the Naval Medical School was started at Haslar Hospital. In 1900 tropical medicine was added to the course of study, and special encouragement was given by the presentation of medals and the granting of accelerated promotion. Voluntary courses were added for senior men who studied but were not subjected to examinations, and this was a great success. Research work was encouraged by the Admiralty, and Lord Selborne, First Lord, took much interest in the work for the prevention of Mediterranean fever. In 1912 the Medical School was moved to the R.N. College, Greenwich, so as to be in touch with other centres in London. About 1900 medical officers in the fleet were supplied with a bacteriological box, and later with microscopes, water analysis boxes, and facilities for the tuberculin test, the preparation and use of vaccines, the detection of the spirochætes of syphilis, and the use of the Wassermann test.

The speaker referred to the work done with Haldane's apparatus in connexion with the ventilation of ships and submarines, and to the examination of shaving brushes for anthrax, of which a series of cases occurred during the war. Many of these were suspected to be cerebro-spinal fever, but anthrax bacilli were found abundantly in the fluid obtained by lumbar puncture. Not infrequently gastro-intestinal disease attributed to food poisoning had to be investigated epidemiologically and bacteriologically, and the speaker alluded to an outbreak at the Royal Naval School, Greenwich, involving 127 boys, and shown to be due to the *B. suipestifer* (mutton type). Since the war much experimental work had been done at Greenwich to find a substitute for lime-juice which had been found so inefficient an antiscorbutic, and good results had been obtained with lemon-juice concentrated in vacuo without heat, and with tinned tomatoes. The importance of laboratory work was now fully recognised in the Navy, especially in connexion with tropical diseases, and laboratories had been provided not only at the three great naval hospitals and at Greenwich, but also in all foreign hospitals and to a less extent in the smaller sick quarters and infirmaries. A body of sick-berth men had been trained for laboratory work. They had a six months' course and an examination, and were given extra pay; they were enthusiastic in their work. Another development was the greater facility now given to naval officers to take post-graduate diplomas, such as the D.P.H., D.T.M., and, the degrees of doctor, &c. The possession of the D.P.H. was now registered in the Navy List as an honourable mention, and was a sine qua non for the appointment of naval health officer at the great ports and certain other posts.

The chief problems in the Navy at the present time were physical training, and the prevention of venereal disease and tuberculosis. Improvement had taken place in recent years in connexion with tuberculosis owing to the better ventilation of ships and better control of the food-supplies, but there were still far too many cases. All infective cases were invalided and the M.O.H. of their home address informed. The speaker advocated an increase in rank and pay for the professors at the Medical College at Greenwich, who should be appointed, respectively, as directors of hygiene and of pathology, responsible to the medical director-general for all naval laboratories throughout the country.

Major-General Sir W. MACPHERSON, in proposing a vote of thanks, welcomed Sir Percy Bassett-Smith as President of the Group. He spoke of his association with him in the South African War in the equipment of hospital ships, when his enthusiasm and energy were boundless. He had been the chief instrument in the development of preventive medicine in the Navy in recent years.

Col. Commandant W. W. O. BEVERIDGE (Director of Hygiene, War Office), in seconding, said that great progress in naval hygiene had been made since the war. The appointment of naval health officers had been a most important step. He had found that they worked in close coöperation with the War Office.

Surg.-Commander R. ST. G. S. BOND (R.N. College, Greenwich) spoke of his association with Sir Percy Bassett-Smith, and alluded to the improvements in the facilities for study which he had brought about.

Dr. P. CALDWELL SMITH (M.O.H., Wandsworth) referred to an old book by Surg.-General Pringle (1740) on "Diseases of the Army," and said that the conditions in the Army at that time were evidently as bad as in the Navy.

Dr. C. SANDERS (M.O.H., West Ham) regretted that there was not a huge audience of students and of the exalted authorities from all countries to hear of the success of the course of practical work and instruction without examination.

The CHAIRMAN said that Sir Percy Bassett-Smith's communication had emphasised the success of the new group, and would foster the spirit of coöperation not only between the medical officers of the three forces, but also with civilian medical officers.

SOUTH-WEST LONDON MEDICAL SOCIETY.

Syphilis.

A MEETING was held at Bolingbroke Hospital on Dec. 7th, when Dr. A. WHITFIELD gave a lantern lecture on Syphilis.

After alluding briefly to the primary lesions and showing slides giving the less usual and common situations, Dr. Whitfield devoted himself to the cutaneous manifestations of the secondary and relapsing stages. Of these he showed practically a complete series of pictures, as well as a few microscopical sections, including psoriasiform syphilide and syphilitic lymphangitis of the face. He also discussed the differential diagnosis of the various lesions and some fallacies in former descriptions—e.g., the tuberculous nature of part of the corymbose rash. The last case described was that of a woman with a condition variously diagnosed as syphilis and lupus. It was completely cured by anti-specific remedies, but recurred later, following parturition, and was then cured by the Finsen light.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.

A MEETING of this Association was held on Dec. 13th at the Elizabeth Garrett Anderson Hospital, Dr. LOUISA MARTINDALE, the President, in the chair, when papers on the subject of

Sterility

were read by Dr. CHRISTINE MURRELL and Dr. ELIZABETH BOLTON.

Dr. MURRELL ran briefly and systematically through the possible causes of the condition, emphasising at the outset the importance of considering the condition of the husband as well as of the wife. She said that where active spermatozoa are present in the seminal fluid, sterility may be due to incomplete or too rapid coitus, to mechanical obstruction to the upward passage of spermatozoa—as, for example, in cases of uterine displacement, cervical obstructions, or profuse discharge from or stenosis of the internal os. The uterine lining may be unsuitable for imbedding, or there may be disease of the tubes or of the ovaries. Apart from mechanical causes which could often be treated surgically there was still much work to be done in the study of the endocrine glands as they affect pregnancy. Dr. Murrell discussed at some length the hormone theory of sterility and the effects of administration of preparations of thyroid, posterior pituitary, thymus, and ovarian extracts on menstruation, ovulation and pregnancy, indicating the theoretical grounds on which the different endocrine preparations might be expected to be of value and the particular conditions in which she had found them useful.

Dr. BOLTON then read the following summary of 150 cases of sterility treated by her:—

I have put together the cases I have had in private of persons complaining of sterility after having been married more than two years. I have not attempted to get statistics from hospital patients, partly because of lack of time, partly because one does not get as fair a chance of talking with the patients and of advising examination of the husband as a preliminary measure. In all cases I try to find out what kind of life the patients lead, whether they tend to overwork physically or whether there is marked mental strain, also whether dyspareunia is present. This last condition is treated if present; in some cases dilatation with a stretching speculum is enough. In others I get the patient a graduated vaginal dilator and advise her to use it for half an hour daily for two months. In the extreme cases I examine the patient under an anæsthetic and dilate the vagina at one sitting. If possible, I prefer the more gradual methods. The frequency and time of connexion are then inquired into, especially in relation to the desires of the woman. To those who complain that there is no retention of semen I generally suggest the use of a bolster to raise the hips, and the alteration of position from the dorsal to the semiprone after intercourse.

I have notes of 150 cases examined, 28 of whom were seen once only and not treated. This leaves a total of 122 treated cases, of whom 63 became pregnant. On considering these cases I find they fall into four different groups according to the gynæcological findings, and I have found a gynæcological abnormality in all the 150 cases. 86 had marked anteflexion, the majority of these an elongated cervix pointing forward, 20 had retroversion, 28 fibroids, 16 were tube cases. Of the 86 anteflexion cases 16 were untreated; of the remaining 70, 40 became pregnant; 52 had a dilatation and curetting, 3 after trial of the passage of a sound—of these 27 became pregnant; 19 had a sound passed only and 10 became pregnant; 2 had vaginal septa and became pregnant later; 1 had injection of semen twice, after 2 dilatations, but with no result. One had an exploratory operation, when the ovaries were found to be adherent and freed, and a dilatation was also done, and this patient became pregnant. In all these cases the passage of the sound and dilatation were done, if possible, at such a time as to allow intercourse before the next period. The time of pregnancy in relation to the operation varies greatly—in the majority of cases it occurred within a few months, in a few cases at once, and in a few others after two to three years, but I have not heard of any after a longer period than three years.

Several of the dilatation cases were operated on on account of dysmenorrhœa as well as sterility, and many of these were much better from the point of view of the dysmenorrhœa, though they did not become pregnant. Of the 20 retroversions 2 were untreated, 13 of the 18 became pregnant; 11 were replaced and a Hodge pessary inserted: 4 of these had a dilatation, 2 had a sound passed. Of the 11 cases treated with a Hodge, 7 became pregnant. Two retroversions with adherent tubes had an exploratory laparotomy and both later became pregnant. Five Gilliam operations were done for sterility and 4 of these patients became pregnant. Of the 16 tube cases 3 were untreated, 13 had operative treatment, and 4 became pregnant. All these 4 had the right tube only involved, complicated by the appendix. Of the 28 fibroid cases, 7 were untreated; of the remaining 21, 7 became pregnant, 2 of these had a large polyp removed by the vaginal route, the other 5 had several fibroids removed by abdominal myomectomy. I usually advise myomectomy patients to avoid pregnancy for six months after the operation. I have had one patient from whom I removed two large fibroids by myomectomy who was found at the time to be about two months pregnant. She had had no previous pregnancy, had been married 14 years, and was 42. She went to term satisfactorily.

In considering this small number of cases Dr. Bolton thought it worth noting that all had a gynæcological condition that might account for the sterility; and that over 51 per cent. of the total treated cases became pregnant.

Anteversion Cases.

No. of Cases.	Age.	Time married in years.	No. of Cases.	Age.	Time married in years.
1	21	2½	5	32	*5, 11½, 4, 3,* 8
3	23	2, 3, 3	8	33	*4,* 4, 10, 9, 7, 7, 5, 5
3	24	3, 3, 4			
3	25	*4, 3,* 2½	3	34	5, 2, 3
8	26	2½, 4, 2, 4, 2, 3, 4, 4	4	35	10, 3½, 9, 9
			3	36	13, 10, 3½
4	27	3, 2½, 3, 3	5	37	7½, 7, 4, 2, 3
5	28	3½, 7, 6, 4½, 2½	4	38	3, 7, 7, 13
5	29	3, 4, 3, 5, 3	1	40	7
8	30	3½, 8, 9, 5, 2½, 10, 7, 8	1	41	7
			1	42	*15*
10	31	10, 3, 3, 2, 2, 6, 5½, 5, 2, 5			

Retroversion Cases.

2	26	6, 2	1	33	*6*
1	27	3½	2	35	*5,* 7
3	29	2, 4, 3	3	36	*5,* 6, 5
2	30	9, 3	1	38	7
2	31	5, 6½	1	40	*2*
1	32	7	1	44	17

Tube Cases.

1	24	*3*	2	32	8, 6½
1	25	*4*	1	33	*5*
2	26	3, 3½	1	35	10
1	27	4	3	36	9, 4, 6
2	31	7, 8	2	37	14, 10

Fibroid Cases.

1	28	4	1	40	12
1	30	3	3	41	5, 5, 7
2	32	7, 8	3	42	18, 12, *9*
2	35	10, 13	1	43	*11*
1	36	*3*	4	44	20, *9,* 14, *14*
2	37	*3,* 7	1	45	17
1	38	10	1	46	16
1	39	*4*	3	48	20, 4, 12

The above is a scheme of the cases of sterility showing age of patient and length of marriage. Cases italicised became pregnant.

LIVERPOOL MEDICAL INSTITUTION.

A MEETING of the Pathological Section of this Institution was held on Dec. 8th, Dr. J. E. GEMMELL, the President, being in the chair, when Prof. J. M. BEATTIE read a paper on

Encephalitis Lethargica.

Prof. Beattie dealt mainly with the pathological conditions found in encephalitis lethargica, basing his remarks on the post-mortem examination of three cases. The main pathological changes found were the congestion, both in the membranes and in the cerebral tissues, and the perivascular infiltration with occasional hæmorrhages in the Virchow-Robin space. The nerve cells showed degenerative changes—pigmentation, eccentricity or loss of nucleus, vacuolation, &c. Neurophagia was present, but only in a minor degree. Irregular rounded or oval bodies, sometimes with an apparent central spot, were seen in the nerve cells, but these were thought to be degeneration products and remains of Nissl granules. Very large numbers of "hyaline bodies," described by Boyd and by various Italian observers, were demonstrated, especially in one case (a woman, aged 48 years), but they were present also in the other cases (aged 54 and 19 respectively). The relation of these to corpora amylacea was discussed, and Prof. Beattie concluded that the bodies were produced by degeneration of myelin, that they had no proved ætiological significance in the disease, as stated by some of the Italian workers, but that their presence could not be regarded as accidental or as having no special pathological relation to the virus of encephalitis. It was shown in one case, where the first symptom was ophthalmoplegia, that these bodies were present in considerable numbers in the optic nerve, and especially associated with a perivascular infiltration of the sheath of the nerve. The bacteriological findings, and the experimental production of the disease were discussed. Reference was made to the recent communication of Delaunay suggesting that encephalitis lethargica was a form of rabies, and the similarity between the pathological findings in the two diseases was dealt with. The relationship of the disease to poliomyelitis and to influenza was also discussed.

Prof. Beattie concluded that the disease was a distinct entity, that the naso-pharynx and salivary secretion harbour the virus, and that therefore it was important that throat and nose disinfection should be urged. He made an appeal for a coöperation between the pathologist, the bacteriologist, and the physician in the investigation of this disease, both during life and in the post-mortem room, and especially urged that the post mortems should be undertaken only by thoroughly trained and experienced pathologists.

LEEDS AND WEST RIDING MEDICO-CHIRURGICAL SOCIETY

A MEETING of this Society was held at the General Infirmary, Leeds, on Nov. 25th, in conjunction with the Leeds Branch of the British Dental Association, Sir BERKELEY MOYNIHAN, the President, in the chair.

Dr. BERTRAM WATSON opened a discussion on

Oral Sepsis and Systemic Disease.

After referring to Dr. William Hunter's pioneer work, the speaker said he purposed dealing mainly with chronic apical infection, probably the most important of the focal infections. He briefly alluded to Rosenow's work on selective localisation of bacteria, and described the changes found at the apices of infected teeth, emphasising that these conditions are frequently symptomless, and only discoverable by dental radiography. Dr. Watson enumerated various systemic disorders which may be attributed to oral sepsis, laying stress on malignant endocarditis, nephritis, and the rheumatic group of diseases. He concluded with a plea for closer coöperation between physician, dental surgeon, and radiographer, and for a fuller recognition of the potentialities of dental work.

Mr. H. B. SCARGILL explained the methods used in the X ray examination of the teeth, illustrating his remarks by numerous lantern slides.

Dr. SINCLAIR MILLER dealt with the Pathology and Bacteriology of Oral Sepsis. He described the various types of gingivitis and pyorrhœa alveolaris, and expressed the opinion that other factors as well as bacteria were essential for the production of these conditions. In speaking of apical and peri-apical infections of the chronic type, Dr. Miller quoted his bacteriological findings in a large series of teeth condemned by X ray and removed from patients suffering from systemic disease with a view to vaccine therapy. Streptococci, falling chiefly into the viridans group, were obtained from all specimens of the series; other organisms in addition were cultured in a small percentage of the cases. Dr. Miller demonstrated slides of bacteria lying in granulomatous tissue removed from the apices of infected teeth.

Mr. G. A. PHILLIPS said that though Dr. Hunter's work had led to a proper appreciation of the damage caused by septic conditions in the mouth, there appeared to be grounds for complaint in some quarters against the increasing sacrifice of teeth in the treatment of certain systemic disorders. After discussing the mode of origin of peri-apical infection and chronic suppurative periodontitis, Mr. Phillips stated that many dentists had doubts as to the results of devitalisation of pulps and of attempts at disinfection or preservation of asepsis in root canals by the use of caustic and antiseptic drugs. He pointed out that the difficulty might be met by the use in an aseptic root of a neutral filling material and, in cases where antiseptics are required, by drainage and redressing at short intervals, removing all traces of drugs before introducing the permanent filling. He expressed doubts as to whether complete confidence should be placed in radiograms; the dentist should require reasonable proof of the need for sacrificing any large number of teeth. Mr. Phillips entered a plea for a wider exercise of caution and thoroughness in diagnosis.

Mr. G. L. WILKINSON said that while there was perhaps no positive proof that focal abscesses or granulomata at the apices of the teeth were often the cause of infected hearts and joints, a large quantity of circumstantial evidence had been presented during the last few years. He asked that these cases should be considered without prejudice and with a close coöperation between physician and dentist. He entered a strong plea for a careful conservative treatment, pointing out that areas of rarefaction, as shown by radiology, disappear after infection is removed. He advocated as suitable for front teeth the method of amputation of the necrotic apex through the outer wall of the alveolar process after filling of the canal with some hard and suitable material.

HEALTH EXPOSITION IN NEW YORK.—A public exposition of the way in which various official departments and charities work together to promote public health was held in New York from Nov. 14th–19th. About 50 social service and charity organisations were represented, and means of combating preventable disease occupied a prominent place.

ASSOCIATION OF INFANT WELFARE AND MATERNITY CENTRES.—Lady Barrett recently addressed the Workers' Section of this Association on Birth Control, and Miss Margaret French has suggested that the Workers' Section should adopt a definite policy on this matter. This suggestion will be discussed at a special meeting to be held early in January. The next conference of the Workers' Section will take place at the Midwives' Institute on Jan. 27th, at 8 P.M., when Dr. Eardley Holland will lecture on Causes of Neo-natal Death.

Reviews and Notices of Books.

STUDIES IN THE PALÆOPATHOLOGY OF EGYPT.

By Sir MARC ARMAND RUFFER, C.M.G., M.D.Oxon., late President of the Quarantine Council of Egypt. Edited by ROY L. MOODIE, Ph.D., Associate Professor of Anatomy in the University of Illinois. Chicago: University of Chicago Press. 1921. Pp. 372. $7.50.

THIS beautiful volume is designed as a memorial tribute to the big-hearted and cosmopolitan pathologist who lost his life during the war. Born in Lyons of a French father and a German mother, educated at Oxford and University College, London, Ruffer was a pupil of Pasteur and Metchnikoff at the Pasteur Institute, and was first Director of the British Institute of Preventive Medicine in Cairo. Ruffer spent most of his life in Egypt, where his wonderful gift of tongues, his gentleness and urbanity, and his wide sympathies enabled him successfully to carry on the difficult task entrusted to the polyglot body known as the Sanitary, Maritime, and Quarantine Council of Egypt. In this work his gifts of diplomacy and tact and his cosmopolitan culture found scope for their expression.

Visiting the Government Medical School in Cairo in 1908 at a time when the work of investigating the pathology of the ancient human remains from Egypt and Nubia was in progress, Ruffer became smitten with the desire to participate in this task. Before then it had been the practice to submit ancient Egyptian pathological material that called for histological or bacteriological examination to Prof. S. G. Shattock, at the Royal College of Surgeons of England, or to Profs. A. R. Ferguson and A. Looss or Dr. Charles Todd in Cairo, but in 1909 Sir Marc Ruffer seriously tackled the problem of devising a technique for the histological examination of tissues in some cases as much as 60 centuries old. After laborious experimentation he at last achieved success, and it is a striking tribute to his skill and patience that he was able to obtain such remarkable histological preparations of the tissues and organs of mummies and predynastic bodies and demonstrate the presence of bilharziosis in ancient times. But he was so fascinated by this technical achievement that he did not pay sufficient attention to the wider problems opened up by his methods. He does not seem to have formulated any scheme of organised investigation or to have got any sense of historical perspective. As a consequence, his work adds little to our knowledge of the history of pathological conditions. Indeed, the view he gives us of the incidence of disease in ancient Egypt is partial and misleading, and questions of chronology are not given adequate consideration.

Sir Marc Ruffer was one of those gentle diplomatists who was ready to take other people at their own valuation. In this volume many erroneous statements are made on the strength of misleading information supplied to him by others. One instance of this is of sufficient practical importance at the present time to call for special reference. This is the "Study of Abnormalities and Pathology of Ancient Egyptian Teeth," published posthumously in the *American Journal of Physical Anthropology* and reproduced as a chapter in this book. The claim made on p. 297 as to the common occurrence of dental caries in predynastic Egyptians is utterly misleading. This affection was extremely rare in Egypt until the latter part of the Second Dynasty, and it was not really common (and then only in the upper classes) until the time of the Pyramid Age (Fourth Dynasty).

The book has been produced by Lady Ruffer and the work of editing these reports was entrusted to the sympathetic care of Prof. Roy Moodie, of Illinois, who has performed his task as well as one unfamiliar with Egyptian conditions could do it. In a volume of such dimensions there are singularly few misprints. A mistake that was made in the Proceedings of the Royal Society of Medicine (1920) has been repeated in this volume; the portraits of Thutmose I. (Plate LXV.) and Thutmose IV. (Plate LXIV.) have been exchanged.

The University of Chicago Press is to be congratulated on the excellence of the printing and illustration of this volume and for undertaking the publication of this memorial of, and tribute to, a fine man.

LABORATORY EXAMINATIONS.

Comment Interpréter en Clinique les Réponses du Laboratoire? Par HUGEL, DELATER, and ZOELLER. Paris: A. Maloine. 1922. Pp. 139. Fr.5.

THIS handy little book sets out to tell the practising medical man how to set about getting laboratory investigations made and how to interpret the answers which he gets. The instructions given are clear, definite, and sufficiently dogmatic; some specimens he can obtain himself, in other cases (e.g., blood counts) he is wisely told to fetch a technical expert to the patient's bedside. Similarly, the deductions he may draw from the results are put shortly and pointedly, and the book concludes with a catalogue of what laboratory examinations may usefully be made in each disease. The ideal which the book serves is not perhaps a very high one—it savours too much of the penny-in-the-slot machine—but making allowances for slight differences between French and English fashions and practice it should be useful in a field which we may hope improvements in medical education will soon make obsolete. There is a good index—not too common a feature in French books. The title page is dated a year in advance—this may be a misprint.

HYGIENE OF WOMEN AND CHILDREN.

By JANET E. LANE-CLAYPON, M.D., D.Sc. Lond., Dean and Lecturer on Hygiene in the Household and Social Department, King's College for Women. London: Henry Frowde and Hodder and Stoughton: 1921. Pp. 354. 15s.

IN the early days of hygienic activity the energy of the workers was directed mainly toward devising and promoting measures for improving the environmental conditions of the people, and it would be difficult to exaggerate the immense advantage to our national health that has resulted from their labours. The provision of pure and wholesome water-supplies, better means of excrement disposal, reform of scavenging arrangements, and improvement in housing conditions were among the first problems to receive attention. The isolation in hospital of the infectious sick, the prevention by means of well-devised schemes of sanitary administration at the ports of the introduction into the country of infectious diseases from abroad, and the supervision of the milk- and food-supplies have all contributed to great improvement in the public health. In later years another phase of hygiene developed, which concerned itself with the care of the individual rather than of his environment, and resulted in the institution of schemes for the medical inspection of school children, the treatment of patients suffering from tuberculosis and venereal diseases, and for maternity and child welfare.

It is with the last-mentioned sphere of public health activity that Dr. Lane-Claypon deals in the book under review. She maintains that of all the time-saving devices known the best and most effective is knowledge coupled with experience. If the proper way of doing a thing is known much less time is taken over it, and, as experience is gained, the nervous system works more quickly and a further reduction in time is brought about. The chapter on fresh air and ventilation is instructive and embodies the results of recent scientific work on this subject. The question of the influence on health of the prevalence of dust and dirt in towns is fully considered. In a table showing the relative amount of soot and dirt deposited per square mile in different towns and areas, that at Malvern is lowest, being only 78 tons per square mile per annum. The

highest figure is that for Glasgow, where it is estimated as 1330 tons, while in London, at Buckingham Gate, it reached 500 tons. The information given on food and diets is up to date and allots to modern work on vitamins an adequate space. Dr. Lane-Claypon's remarks on the use of alcohol are, as a whole, founded on common sense and experimental results, but she makes certain general statements on the subject, the accuracy of which is at least open to question. On p. 185, for example, the following paassge occurs: "Anyone who will take the trouble to make observations will readily discover that the most alert people, who preserve the elasticity of their mind and body with advancing years, are those who do not take alcohol. Those who early lose their muscular agility, and whose minds get set, will usually be found to take alcohol habitually, although not necessarily in large amounts." She makes some interesting remarks on the "psychological aspect of dress," and attaches more importance to clothes as an expression of personality than is usually accorded to them.

On the whole, Dr. Lane-Claypon has produced an excellent book which can be recommended to health visitors, and indeed to all who are interested in the health of mothers and young children.

PRINCIPLES AND PRACTICE OF SURGERY.

By Dr. A. HERMAN HAUBOLD, Clinical Professor in Surgery, New York University. London and New York: D. Appleton and Company. 1921. In two volumes. With 633 illustrations. Pp. 2482. 84*s*.

THIS work is a result of the thoughtful consideration and laborious toil of an experienced surgeon. The book contains much detailed information in a small compass. Few recent advances have been left unnoticed, and the judgment of the author in selection is admirable. The whole of surgery, general and special, is included in two volumes, which contain profuse and well-chosen illustrations. The insertion of special chapters on Biology, Anatomy, Physiology, Pathology, and Bacteriology takes up space which might, perhaps, have been better used, but a reminder of these subjects may well be needed by the young surgeon. We applaud the details of surgical practice enunciated by Dr. Haubold; discussion of the principles of surgery, as we understand them, seems less satisfactory. For example, wound repair is considered apart from inflammation, certain resemblances being recognised, but modern views hardly allow of such separation. Again, every form of "itis" is here described as if it were more or less of a special entity, and different forms of inflammation are called catarrhal, suppurative, putrid, phlegmonous, gangrenous, &c. No student should be taught in this manner if confusion of mind and hopelessness of outlook are to be avoided. A student must be impressed with the essential similarity between inflammatory processes throughout the body; that by the careful study of a boil he can unravel the pathological happenings in an inflamed tonsil, appendix, or prostate, and that in an inflamed conjunctiva he can watch the changes which occur in inflamed serous and synovial cavities.

As further examples of the form of teaching adopted in this book, we would draw attention to the absence of general principles in dealing with the hollow muscular viscera and the tubes of the body. From the description of the symptoms and signs of chronic obstruction due to gall-stones the student might easily gather that the gall-bladder and duct follow a special law of their own instead of conforming to the general behaviour of hollow muscular coated viscera and tubes; all of them hypertrophy, thicken their walls, and contract their cavities when opposed to a surmountable obstacle; all of them dilate and become thin-walled when the obstacle they are up against is insurmountable.

It is only fair to say, in comparing this book with standard English works, that many of these equally neglect fundamental principles, but it is so important for teachers to impart and for students to equip themselves with these principles that to point out their significance is an obvious duty. It is for this reason that we would recommend Dr. Haubold's work to surgeons rather than to students, for the former will have grasped the principles underlying their craft and will find in these volumes much suggestive material for their guidance in the solution of difficult problems.

BIOCHEMISTRY.

Practical Physiological Chemistry. Third edition. By J. A. MILROY, M.A., M.D., Lecturer on Biochemistry, Queen's University, Belfast; and T. H. MILROY, M.D., B.Sc., F.R.S.E., Professor of Physiology, Queen's University, Belfast. London and Edinburgh: W. Green and Son, Ltd. 1921. Pp. ix.+449. 21*s*.

THE rapid growth of biochemistry necessitates frequent revision of the text-books dealing with this subject. In the present edition of this work matter suitable for the use of senior students has been added. The more advanced portions and all the practical exercises are set in different type from the rest of the book, part of which is of necessity theoretical. A few references are also given. The instructions for the practical work appear to be clear and adequate, though the general impression given by the work is that it represents the result of successive graftings on to an original and apparently rather ancient stock of class-notes. Rather too little has been cut away at each graft of new material, with the result that there is too great a variety of methods. Thus, two methods for preparing glycogen from liver are given; at least eight methods for the estimation of glucose, and three for the volumetric estimation of chloride in urine may also be mentioned as examples. Among the valuable newer methods are the colorimetric method for determination of hydrogen-ion concentration, the determination of the phosphate ratio of the urine (the method of calculation of which might have been given more clearly), the determination of amino-nitrogen, and various colorimetric methods of quantitative analysis. It is to be regretted that the authors found that space would not allow of a proper treatment of the physiological applications of gas analysis, because no senior student's course is complete without some acquaintance with these methods, on which so much of modern physiological views are based. The addition of tables and schemes for analysis complete a very useful book. The authors would be well advised, in the preparation of a future edition, to provide a critical friend with a copy of the book and a blue pencil, and to give him carte blanche; such a test of friendship would furnish us with one of the best books on the subject of physiological chemistry which any teacher could desire.

Dictionnaire de Biologie Physiciste. By ALBERT and ALEXANDRE MARY. Paris: A. Maloine and Fils. 1921. Pp. xvi.+408. Fr.40.

THE general conception of this work is doubtless excellent; physical and physico-chemical aspects of biological problems figure largely in the programme of modern investigation, and an encyclopædic dictionary dealing with the more important of these questions and giving such references as would enable further inquiry to be pursued, would be valuable to many. On reference to the work before us, expectations, however hopeful, are speedily disappointed, for it is little else than a rag-bag of out-of-the-way information of all sorts, and, since most of the matter is not even up to date, it can fulfil no useful purpose. For example, there is no section on electricity, radium, or fluorescence; the section dealing with osmosis is antiquated both from the biological and physico-chemical standpoints; nothing is said of recent work on luminescence. The general degree of accuracy which prevails can be judged from the following extract: "*Hormones*—Starling a donné le nom d'hormones aux produits colloïdaux versés dans le

sang par les glandes à sécrétion interne ou glandes endocrines." This section contains only three references, to the names of Pende, Lévi, and Bordeu! No less than 83 pages are occupied by the subject of Hydrogeology. It is evident from the list of references at the end of each section, where the names of the authors are almost invariably to be found, that this book contains merely matter in which they are especially interested, and is not a dictionary in any true sense of the term. Had the work been written under a title such as "Gleanings of Biologists in the Domain of Physics," and strung together by some sort of thread, it would possibly have been more interesting, and would certainly have been more welcome.

Some Micro-Chemical Tests for Alkaloids. By CHARLES H. STEPHENSON, Scientific Assistant, Bureau of Chemistry, U.S. Department of Agriculture, Washington, D.C. Including Chemical Tests of the Alkaloids Used, by C. E. PARKER, Assistant Chemist, Bureau of Chemistry. London: Charles Griffin and Co., Ltd. 1921. With 27 plates (162 photomicrographs) and a folding Table of Reactions. Pp. 106. 21*s.*

THE authors have examined various reactions of 51 alkaloids in order to obtain microchemical tests. Some of the reactions are very sensitive and characteristic; in other cases the results are satisfactory though not all that might be desired; only three alkaloids gave no reaction. Photomicrographs of all the more important crystalline precipitates are shown in a series of excellent plates. Most of the work was done between 1907 and 1910, and the results have been published in preliminary communications which are now welded together for the first time. Full acknowledgment is given to other workers who have published data on microchemical tests. The authors' tests were made in concentrations of 1 in 1000 to 1 in 50, except in the case of quinine, which did not yield satisfactory crystals in solutions less concentrated than 1 in 35. A list of reagents is given, followed by an account of methods and a general scheme for identification. The tests of 51 alkaloids with 35 reagents are summarised in a table at the end of the book, which must be regarded as a valuable contribution to the subject, and is sure to be welcomed by those engaged in the work of identifying alkaloids.

TECHNIQUE OF THE TEAT AND CAPILLARY GLASS TUBE.

Second edition. By Sir ALMROTH E. WRIGHT, M.D., F.R.S., Principal of the Institute for Pathology and Research, St. Mary's Hospital, London, with the Collaboration of LEONARD COLEBROOK, M.B., B.S. Lond., Assistant, Bacteriological Department, National Institute for Medical Research. London: Constable and Co. 1921. Pp. 384. 42*s.*

DURING the nine years since the first edition of this work appeared the technique of the teat and capillary glass tube has been pressed into service in the unravelling of many new problems. The second edition is in every way a bigger book, longer by 173 pages, larger in size, wider in its sphere of application, and broader in its conception. It is now described as a handbook for the medical research laboratory and the research ward.

The value of the methods described lies in the fact that they can all be carried out with minimal quantities of reagents, a matter of considerable importance on occasion, as when it is desired to study the blood at frequent intervals. There are many additions and improvements. The fourth chapter, dealing with general principles of the technique, has been elaborated and new methods of considerable interest are described. To Chapter VII. have been added three valuable clinical appendices. The first deals with the clinical significance of increased and diminished blood coagulability and on the method of correcting these conditions. The second deals with the pathology of acidosis, and in particular with the part that this plays in shock, gas gangrene infection, and scurvy. The third treats of the physiological significance of the antitryptic function of the blood, and will appeal, by reason of its suggestions of methods of treatment, to the practising surgeon as well as to the research worker. The original methods described in Chapter X. for the study of the emigration and other biological functions of leucocytes will be of interest and service to biologists, physiologists, and pathologists. The illustrations of this chapter are masterpieces of lucidity and detail.

In Chapter XI. are described techniques for the study of the place of origin and source of the protective substances elaborated in the organism. The introductory remarks that "everything that relates to this department of research is in a quite inchoate condition" prepare us for a rather involved chapter, and we wonder if the coining of such terms as "aipsēro-epiphylactic response" will prove helpful or otherwise to most readers. Chapter XII. admirably describes the techniques elaborated by the authors during the late war for the study of infected wounds. To this chapter are appended some suggestive remarks on the phenomena of diffusion and osmosis.

The book is lavishly illustrated with admirably executed drawings and coloured plates by Mr. A. Kirkpatrick Maxwell. Altogether the work is a notable production which we confidently commend to all engaged in medical research.

AIDS TO MEDICINE.

Third edition. By BERNARD HUDSON, M.D. Camb., M.R.C.P. Lond., Swiss Federal Diploma, Physician in charge of the English Sanatorium at Montana, Switzerland. London: Baillière, Tindall and Cox. 1921. Pp. 370. 4*s.* 6*d.*

THE third edition of this small book has been enlarged to include a chapter on diseases of the skin. The primary object of the author, the production of a revision book of a convenient size for the student to carry about, has been successfully accomplished, but the real *raison d'être* for a new edition—the rejuvenescence of contents—has not been met. Without increasing the size of the volume the subject matter could have been brought up to date in many respects, when it would have proved of more value to students desiring to effect a rapid revision of their work.

HEREDITY.

Erblichkeitslehre und Rassenhygiene. Band I. *Menschliche Erblichkeitslehre.* By Prof. ERWIN BAUR, Prof. EUGEN FISCHER, and Dr. FRITZ LENZ. Munich: J. F. Lehmanns. 1921. Pp. 305. 11*s.*

This is the first or introductory volume of what is intended to be a fairly complete compilation on the subject of heredity, especially in relation to national health and eugenics. This part deals with the scientific and fundamental aspect of heredity, leaving the national aspect for the second volume. The book is divided into four sections, distributed among the three authors, the first of whom, Prof. E. Baur, describes the principles and laws of variation and heredity. Under the heading of Myxovariation the theory of Mendel is explained, with numerous of the standard examples from crossing experiments on plants and animals. By paravariation is meant difference within the normal range, but with no tendency to transmission to offspring, and by ideovariation the spontaneous evolution of differences capable of transmission—mutation—of which the classical example is the evolution of a new species of evening primrose. The three types of variation are described, without the addition of any new material. In the second section, Prof. E. Fischer describes, somewhat superficially, the differences met with between the existing races of man. The evolution of man from his anthropoid ancestors is also dealt with, and some attempt is made to show the relationships between the existing branches of the human race. This section is unduly condensed into less than 70 pages. In the third and

fourth sections Dr. F. Lenz reviews the collected knowledge on diseases which are in any way transmissible, and though the list is not complete much interesting material has been set forth, illustrated by numerous genealogical tables. The fourth section deals mainly with heredity in mental and psychopathological conditions, with some remarks on the heredity of genius, and the mental attributes of certain races.

The bibliography is considerable, though certain omissions are apparent. The authors have adopted the useful plan of giving with each reference a brief note of the contents of the work consulted. The sections by Dr. Lenz are likely to appeal to those medical men who are only interested in heredity in so far as it is manifested in disease.

PHYSICAL SIGNS IN THE CHEST AND ABDOMEN.

By A. J. JEX-BLAKE, M.A., M.D. Oxon., F.R.C.P. Lond., formerly Physician to St. George's Hospital and Assistant Physician to the Hospital for Consumption, Brompton. London: J. & A. Churchill. 1921. 9*s.* 6*d.*

IN this publication Dr. Jex-Blake has kept clearly in view the wants of beginners in that fundamental branch of medicine with which his book deals, yet the medical practitioner and senior student will find many interesting points elucidated in the paragraphs of small type freely scattered through the volume. Several physical signs which are especially puzzling to the student receive explanation; thus it is pointed out that the diminished vocal fremitus which is sometimes met with over a consolidated lower lobe in a case of lobar pneumonia really depends on an accumulation of secretion in the bronchi, and that, after a bout of coughing sufficient to empty the air tubes, the more typical "increased vocal fremitus" will reappear. In like manner many pitfalls are guarded against, and sound advice in carrying out the physical examination of the patient is given. It is a matter for regret that uniformity in the nomenclature of abnormal physical signs is still far to seek, and we are glad to note that Dr. Jex-Blake makes increase in the *clearness* of the transmitted sound the essential criterion of pectoriloquy. He closes with a chapter devoted to a consideration of the more important abdominal swellings.

The book is concerned with ordinary physical examination and intentionally contains no account of the use of the sphygmomanometer, polygraph, electrocardiograph, or Rontgen rays in diagnosis. The illustrations consist of outline diagrams and useful graphic representations of heart-sounds and murmurs, and the whole forms a concise and lucid introduction to an essential branch of medical practice.

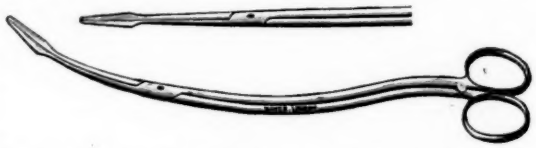
JOURNALS.

ARCHIVIO DI PATOLOGIA E CLINICA MEDICA. Vol. I., No. 1. October, 1921. Pp. 102. Bologna: Casa Editrice, L. Cappelli.—This new periodical has just been issued under the joint editorship of Prof. Luigi Zoja of Pavia, Prof. G. Viola, and Dr. F. Schiassi of Bologna, to whom we wish every success in their enterprise. There are four papers in the opening number, each followed by a résumé in French for the benefit of readers who are not familiar with the Italian language. Prof. Viola contributes an essay on the principles of diagnosis in which he incorporates the views of many other distinguished observers. For him a purely anatomico-pathological doctrine is untenable; the seat of disease cannot be isolated from other changes in the organism, and medical science must hold a just balance between the anatomical and functional elements in diseases. For him, also, a diagnosis must necessarily be differential, whether it is direct or intuitive, automatic or analytical, or rational. He admits three forms of control—i.e., the history, the maxim of Bacon "sublata causa tollitur effectus," and quantitative judgment. He asks the question, Is medicine a science or an art? and solves it by answering that it is both—a science in its diagnostic and an art in its therapeutic aspect. His main conclusion is that a mechanical clinical doctrine has had its day and must be replaced by a Hippocratic psychophysical doctrine.—Dr. A. Crosti contributes some original observations on the pathological and clinical aspects of artificial pneumothorax with woodcuts of its macroscopic and microscopic results on the lung tissue. He describes these results in a case of multiple pulmonary abscess and two cases of phthisis, which showed the development of bundles of connective tissue of pleuritic, vascular, bronchial, and interstitial origin.—Dr. R. Grignani discusses the hæmoglobin metabolism in nephritis; his researches point to a frequent oligochromocythæmia, not due to hydræmia alone nor to increased destruction of red cells, but to their inadequate formation. Hence an insufficient diet contributes to the production of anæmia.—Dr. Schiassi describes in a practical article the clinical use of the refractometer. He prefers one of the Pulfrich type and discusses alterations of the refraction index in various diseases and the part it plays in the investigation of the hæmoclasia crisis lately described by Widal and others occurring in disturbed hepatic function. The journal is well printed and is of quarto size and presumably will be issued monthly, but this is not distinctly stated, and we have searched in vain for any indication as to its price.

New Inventions.

TENDON TUNNELLING FORCEPS.

THE forceps shown in the accompanying illustration have been designed for the purpose of making subcutaneous tunnels and pulling tendons through them in the operation of tendon transplantation, the idea being to have an instrument so flattened and tapered as to pass easily through the subcutaneous tissues and, at the same time, act as a forceps. In performing tendon transplantation for musculo-spiral paralysis I use them in conjunction thus: having detached the tendon of the flexor carpi radialis from its insertion and exposed part of its belly and the commencement of its tendon in the upper third of the forearm through a short incision, and the tendons of the extensores ossis metacarpi and brevis pollicis near the wrist through a similar incision, the point of the curved



pair of forceps is passed in subcutaneously at the lower angle of the former and pushed obliquely towards the latter where it is brought into view. The forceps is opened and the subcutaneous space widened sufficiently to accommodate the portion of the muscle belly detached from the surrounding intermuscular septa. The straight forceps is then passed from the incision at the wrist alongside the curved pair which is withdrawn. The tendon of the flexor carpi radialis is then pulled from its natural tunnel and its end being grasped in the straight forceps is pulled along the new tunnel. The same procedure is adopted in dealing with the flexor carpi ulnaris. I have found the curved forceps particularly useful in dealing with a case where the elbow is ankylosed at a right-angle.

The instruments have been made by Messrs. Mayer and Phelps, New Cavendish-street, London, W.

Birmingham. F. WILSON STUART, M.Ch. Aberd.

THE LANCET.

LONDON: SATURDAY, DECEMBER 24, 1921.

The International Standardisation of Sera.

THE Conference held by the Health Committee of the League of Nations on the standardisation, for international purposes, of sera and serological tests was an extremely satisfactory one. Good work was done, and the foundations were laid for its continuance and extension. A difficult set of agenda was dealt with seriatim, and unanimous conclusions were arrived at by sub-committees of men specially chosen by the countries which they represented because of their personal experience. The recommendations of these sub-committees will be found on p. 1339 of this issue of THE LANCET. In several directions they represent an agreement to undertake definite comparative studies, and the result of these is to be finally submitted to the State Institute for Serotherapy of Copenhagen, of which the director is Prof. MADSEN, the chairman of the Health Committee of the League of Nations. The sittings of the Conference will be resumed in about six months' time, probably at the Institut Pasteur in Paris, when progress will be reported and further understandings can be reached.

The international character of medicine has been widely recognised in connexion with the incidence of certain epidemic diseases; that the progress and spread, for example, of plague, cholera, and yellow fever, throughout the world ought to be made the subject of international control has long been recognised. It is generally assumed that, with regard to these diseases, international notification, at least, is well established and systematically carried out. Certainly agreements have been executed between various countries for their mutual protection against the spread of such epidemics, and such agreements rest on the basis of fraternal notification. We hope, however, that it will fall under the health responsibilities of the League of Nations to keep official sanitary authorities everywhere alive to the necessity of this notification as an essential preliminary to the surrounding and stamping out of these diseases; for unfortunately there is little doubt that in some cases international notifications have not hitherto been conscientiously made, in the matter notoriously of plague and cholera. But there are other diseases whose spread from nation to nation is not so obviously preventable by notification but against which common weapons are none the less required and should be made available by the health organisation of the League of Nations. Such are the six great diseases which are, to a varying extent, amenable to serum treatment, or for which serological tests are essential—namely, diphtheria and tetanus, various types of pneumococcic and meningococcic infection, dysentery, and syphilis. But not only do different nations adopt a different protective technique in the employment of sera or in their serological tests, but sometimes the same nation has difficulty in making up its mind which of two or three methods to adopt. It was a most practical move on the part of the Health Committee of the League of Nations to begin its new duties by making an attempt to arrive at international standards in these matters, and it will be seen by our report of the Conference what excellent progress has been made.

The Dull and Backward Child.

PROMINENT features in the annual report of the Chief Medical Officer of the Board of Education have been dealt with in our columns, but we may well go back to this interesting document to consider that part of the report in which Sir GEORGE NEWMAN deals with the dull and backward child. For the dull and backward child often presents difficult and delicate problems to the practitioner, and the lessons to be learnt from the problems presented by our State-educated children are applicable in principle to children of every social status. The curricula of the senior departments of public elementary schools are so arranged that a child entering at the age of 7 years should progress yearly to such an extent that he deserves promotion to the standard above; thus his last year of elementary school would be spent in the highest standard. It has long been known that this ideal has not been reached, but until recently, as far as we are aware, the extent of deviation from this aim has not been measured. A recent investigation, however, into the educational ability of the entire body of children in a representative London borough has shown that barely one-half (46·4 per cent.) are assigned to a standard assumed as normal for their age. When the ability of a child is only equal to that of a "normal" child two years younger than himself the backwardness becomes of real importance. Unfortunately, at least 10 per cent. of the senior school population, the report informs us, present this degree of backwardness, a figure which accords with that arrived at by the medical members of the Education Reform Council, as shown by their report published in 1917. Expressed in round figures, it means that half a million children attending public elementary schools in England and Wales are definitely backward, and constitute potential waste products of the education system. We do not suggest that the same evidences of failure would be forthcoming from those large private schools, which are always known as "the public schools," but even these schools have their dull boys who have managed to scrape through the entrance examination. Those who fail to pass are dealt with by the smaller private schools or receive more individual teaching from tutors. The State elementary school population represents some six-sevenths of the total school population, and it is more than probable that a considerable number of children educated elsewhere belong to the dull and backward group.

The position has for some years received the attention of school medical officers. The late Dr. A. H. HOGARTH, when school medical officer for Buckinghamshire, and subsequently Dr. C. W. HUTT, when working at Brighton, made some inquiries by which this part of the Chief Medical Officer's report is supported, and the results of three valuable inquiries made last year are also incorporated in the report. A detailed extract is quoted from the annual report of Dr. H. P. NEWSHOLME, county medical officer for the North Riding, which deals with the number of defects present in the large number of backward children examined. A classification was not made of the causes of backwardness, apart from physical and mental, nor does the extract quoted inform us as to the number of children presenting combined physical defects, an omission which leaves vague the practical conclusions to be drawn. Information along these lines may yet, we hope, be made available for general use. The manner in which backward children have been dealt with in Croydon and

Manchester merits attention. At Croydon certain backward children were selected and taught in small classes in the hope that they would be able more or less to resume their normal place on the ladder of educational attainments. In Manchester much the same plan has been adopted, but younger children, who were being taught in Standard I. in neighbouring schools, were selected. The making of arrangements of this sort by an education authority might well be considered a practical measure and constitute in a large sense a medical solution of some of the difficulties in the education of the backward child.

A point which should receive consideration is whether, in certain more or less special circumstances, those children of weak general ability who are all round mentally inefficient, but not sufficiently deficient as to be classed as mentally deficient—the very "thickheads"—should not be taught in a special class, associated, it may be, with an ordinary public elementary school rather than in a special class for mental defectives. Children such as these would seem to require tuition of a different character from the mentally deteriorated. It is at present difficult to differentiate between the teaching these children should receive and that given to mentally defective children, but the formation of such a class might help to provide the proper training for the backward child, and also create valuable medico-psychological knowledge. The material for such classes can be found in any thickly populated centres.

Public Health in Egypt.

LIKE many other matters in Egypt, the health organisation of the country is at present undergoing a radical change. Progress must necessarily be slow, but that a beginning has been made is evident from a perusal of Lord ALLENBY's report as High Commissioner for 1920, the medical portions of which have been summarised in two recent issues of THE LANCET.[1] In accordance with the recommendations of the Commission, which sat under the presidency of Dr. ANDREW BALFOUR during the summer of 1918, the director-general of the Department of Public Health has now become an Under Secretary of State for Health, and so enjoys a far more influential position than formerly; the deputy-director has now become director-general; and a new post of inspector-general has been created to which, we learn with satisfaction, an experienced Egyptian has been appointed. These changes in the higher personnel no doubt augur well, but they must be regarded merely as a beginning, for the recommendations of the Balfour Commission cover every aspect of health administration throughout the country, and extend even to the village and the doings of such humble officials as sanitary barbers. When the scheme is complete, there will be a technical adviser and director of medical intelligence to assist the Under Secretary and the director-general; also directors of (1) Sanitary Services, (2) Epidemic Services, (3) Medical Services, (4) Lunacy, (5) Medical Education, (6) Public Health Laboratories, and (7) Sanitary Engineering, and in addition a secretary-general who will control personnel, registration of vital statistics, and similar matters; all these officials to be responsible to the director-general. In this way it is hoped the directorate will be relieved of many trivial matters of detail.

[1] THE LANCET, Dec. 3rd and 10th, pp. 1195 and 1254 respectively.

A knowledge of Egypt and a study of Lord ALLENBY's report indicate that many preventable diseases still maintain their firm hold upon the country. It is a matter for congratulation that the reduction in the incidence of small-pox is as great as 60 per cent. when compared with the figures of the previous year, and from the fact that over ten million doses of vaccine lymph were prepared in the Vaccine Institute during 1920 against half that number in the previous 12 months, it is obvious that a systematised attempt is being made to reduce this scourge. There is apparently to be a general campaign against ankylostomiasis and schistosomiasis, and could these two diseases be appreciably reduced, the increased working capacity of the fellahin would amply repay the capital outlay. Pellagra as an equal drain on the energies of the labourer might well receive attention by those engaged in the attack on the two worm infections. These efforts on the part of the authorities, and many similar ones which are dealt with in the report, read excellently on paper, but as long as the success of their execution depends entirely on administrative reforms, very little improvement is likely to result in the health and happiness of the toiler in the fields, upon the value of whose work the prosperity of Egypt rests. What is essential in addition to administrative reforms is an educational campaign and an attempt to convince the people of the country at large that the disabilities from which they suffer are mainly preventable, but only with the coöperation of every member of the community. Are there signs that such a campaign is in progress or contemplated?

A consideration of the health situation in the Soudan is full of interest. As in Egypt, so in the Soudan, small-pox has been of considerable importance of late. Malaria, on the other hand, stands out in far greater prominence than in Egypt, and a comparison of the diseases prevalent in the two countries shows that there are many striking differences in the relative importance of the various infections demanding attention. The desert has proved an effectual barrier between these two populous areas in the past, but improved communications and the migration of labour, necessitated by the present scheme of Soudan development, have resulted in a changed situation; there is likelihood that much disease will be spread from one country to the other unless adequate precautions are taken to prevent this. To meet the needs of the case, labourers passing from Egypt are now detained in a quarantine camp at Halfa, and there are medically examined, shaved, bathed, disinfected, and treated with a vermifuge. This is a step which appears to have been taken only just in time, and it is to be hoped that no slackness will be permitted in the execution of such measures in the future. Should the worm diseases of Egypt be allowed to spread and take as firm a hold on the population in the cotton-growing areas of the Soudan and exercise an influence as baneful as in Egypt, the authorities will be alone to blame. Another infection which it is essential to control is tuberculosis. The Soudanese show very little resistance to this disease, and when infected usually succumb; the spreader of infection exists for so short a time that little harm results, and the tubercle rate in the Soudan appears to be low. Egyptians, on the other hand, show a far higher resistance and, in consequence, chronic centres of the disease may be established in the Soudan should those infected be undetected and rejected at the frontier. Such an introduction of tubercle into the Soudan might prove as great a calamity as did the infection of the negro in the Southern States of America.

Annotations.

"Ne quid nimis."

RUSSIAN FAMINE RELIEF.

Sir Arthur Stanley, as chairman of the British Red Cross, and Lord Emmott, as chairman of the Russian Famine Relief Fund, have written to the press in support of the National Appeal for the starving millions in Russia. "We wish to make it quite clear," they say, "that while, with the support of the British public, we can do something to save life and to mitigate suffering, it will not be possible for us to deal fully with famine on such a colossal scale as that which unfortunately now exists in Russia. If food is to be brought to the starving population as a whole; if worse famine next year is to be avoided by adequate sowing; above all, if the accompanying epidemics are to be combated at their source and not allowed to spread to surrounding countries, a sum of many millions is needed." They go on to express the hope that a special area or objective may be allotted, small at first, but increasing with the available resources, on which British relief efforts may be concentrated to real purpose. With this object in view they have secured the services of Sir Benjamin Robertson, the eminent Indian famine expert, who is proceeding to Russia forthwith as British Commissioner. The Red Cross Societies and other organisations in India and the Dominions have agreed that any assistance they can give shall be sent through the British Red Cross and Famine Relief Fund, acting on the advice of Sir Benjamin Robertson, and in this way it will be ensured that the relief that goes from the British Empire as a whole will be concentrated as far as possible on one specific objective.

BENJAMIN MARTEN, PIONEER.

A YEAR ago, as Dr. Charles Singer reminded us in his recent Chadwick lecture, there passed unnoted and uncelebrated the bicentenary of a remarkable work, the "New Theory of Consumptions: more especially of a Phthisis or Consumption of the Lungs, wherein . . . Enquiry is made concerning the Prime, Essential and hitherto accounted Inexplicable Cause of that Disease, so very Endemick to this Nation, . . ." by Benjamin Marten, M.D. Instead of marking a revolution in epidemiology, the book scarce raised a ripple on the stream of contemporary thought, and its author pursued his unknown course in his "House in Theobald's Row, near Red Lyon Square in Holbourn," whence his work is dated Sept. 1st, 1719. Of his life we know little. He was not a Member of the Royal College of Physicians, and his doctorate of medicine does not appear to have come to him from an English university. He was obviously well acquainted with the literature of his subject, and quotes freely from the writings of the new microscopists. Already in the fifteenth century Hieronymo Frascator had suggested minute seeds as the cause of infection and the instrument of contagion, and in the blaze of light thrown by the use of the microscope there were not wanting speculations as to the possible connexion between animalcules and disease. But Marten towers above all others for boldness of inspiration and clarity of exposition. Having reviewed historically the theories of infection, he dismisses them as inadequate, and proceeds to set forth, with remarkable insight, the germ theory as we hold it to-day. It is of particular interest to note that he applied his conception to syphilis, rheumatism, leprosy, small-pox, measles, plague, and the common cold, but refrains from committing himself on the subject of cancer.

Some quotations from his book will speak more eloquently for him than any historian can do.

"The *Original* and *Essential Cause* then, which some content themselves to call a vicious Disposition of the Juices, others a salt Acrimony, others a strange Ferment, others a malignant Humour (all which seem to me dark and unintelligible) may possibly be some certain Species of *Animalcula* or wonderfully minute living Creatures, that, by their peculiar Shape, or disagreable Parts, are inimical to our Nature; but, however, capable of subsisting in our Juices and Vessels, and which being drove to the Lungs by the Circulation of the Blood, or else generated therefrom their proper *Ova* or Eggs, with which the Juices may abound, or which possibly being carried about by the Air may be immediately conveyed to the Lungs by that we draw in, and being there deposited as in a proper *Nidus*, or Nest, and being produced into Life, coming to Perfection, or increasing in Bigness, may by their spontaneous Motion, and injurious Parts, stimulating and perhaps wounding or gnawing the tender Vessels of the Lungs, cause all the disorders that have been mentioned, viz., a more than ordinary Afflux of Humours, upon the Part, Obstruction, Inflammation, Exulceration, and all other the *Phenomena* and deplorable Symptoms of this Disease.

"And it is reasonable to suppose that there are various Species of *Animalcula*, so of course they are of various Magnitudes, of different Shapes, and have peculiar Parts . . . so various Diseases, more or less sudden and pernicious, may be caused (by them).

"For how can we better account for the regular types the Small-pox, Malignant, and all other Continual and Intermittent Fevers, as well as many other Distempers, keep and the peculiar Attributes and *Crises*, *etc.*, they have than by concluding they are severally caused by innumerable *Animalcula*, or exceeding minute Animals that variously offend us according as their Species are different, and as their peculiar Shape and Parts are more or less injurious to our Fluids and Solids. . . .

"By what has been said, I think . . . there is possibly no Ulcer or Ulcerated Matter, but what is stock'd with *Animalcula*.

"But I would not be understood to advance that all Distempers are caused by them; I would urge only the possibility and likelihood of their being the Essential Cause of the Plague, Pestilential and other malign Fevers, Small-pox and some other Diseases as well Chronick as Acute and particularly of that dreadful one a *Phthisis* which is the peculiar Subject of these Papers.

"If the Air we breathe, the Food we eat, or Liquor we drink in common with the rest of Mankind, were full of such minute living Creatures or their seed, then we might reasonably suppose that all Persons Breathing, Eating, and Drinking of the same, would in like Manner be more or less liable to the same Distemper, which would in that Case become Epidemical and almost Universal, this therefore we may imagine to happen in the Case of Plagues and Pestilential Distempers, that seize upon whole Cities, Towns, and Countries, at a Time, but not very likely in the Case of the Disease we now treat of (i.e., Phthisis).

"It seems much more probable that the minute Animals or their Seed, which we have supposed to be the Essential Cause of a *Phthisis* or Consumption of the Lungs, are for the most part either convey'd from Parents to their Offspring Hereditarily, or communicated immediately from distemper'd Persons to sound Ones who are very conversant with them; the first way has been already mentioned when we were speaking of the Small-pox . . . the last way, which is properly called Infection, we may conceive to be the more reasonable, if we consider how quickly and easily some other Distempers are communicated from one Person to another, as the Itch, Venereal Disease, etc., which are yet very far from becoming universal.

"It may be therefore very likely, that by an habitual lying in the same bed with a Consumptive Patient, constantly Eating and Drinking with him, or by very frequently conversing so near, as to draw in part of the Breath he emits from his Lungs, a Consumption may be caught by a sound Person; for it may be reasonable to suppose that if the Blood and Juices of such distemper'd People, be charged with vast quantities of *Animalculæ* as I have conjectur'd, then their profuse Sweats, and their Breath, may be likewise charged'd with them, or their *Ova* or Eggs, which by that means may possibly be convey'd into the Bodies of those who lie, or are most conversant with them.

"It may here probably be objected, that if the Disease is communicated after this Manner few that come near a Consumptive Person would escape having that Distemper; but in Answer to this I imagine that slightly conversing with Consumptive Patients, is seldom or never sufficient to catch the Disease; there being but few if any of those minute living Creatures or their Eggs communicated in slender conversations, and which if they are, may not perhaps, be produced into Life, or be nourished or increas'd, in the new Station they happen to be cast; besides, we may imagine that some Persons are of such an happy Constitution, that if any of the *Ova* of the inimicable minute Animals that

cause a Consumption happen to get into their Bodies they may likewise be quickly forc'd out again, through some of the *Emunctories*, before they are produc'd into Life; or else be wholly destroy'd."

A hundred and fifty-seven years later Louis Pasteur laid again the foundation-stone of that castle which his forgotten predecessor had so surely and deftly constructed, if only in the air. Sound as is our principle of "no acceptance without verification," it may yet be permitted to wonder how much suffering might have been prevented in those years, if Benjamin Marten's contemporaries had been willing to accept his theory and wait awhile for the verification which was in their time impossible.

THE ERADICATION OF TUBERCULOSIS IN CATTLE.

AUSTRALIA is the latest convert to a scheme initiated by the Bureau of Animal Industry in U.S.A. and since adopted in Canada for dealing with tuberculosis in cattle. A memorandum from Col. J. A. Gilruth, D.V.Sc., administrator of the northern territory of Australia, explains the accredited herd system, the aim of which is first to get rid of tuberculosis in a pure-bred herd of cattle, and when this has been done to give the owner the advantage of having his herd placed on an official list of tuberculosis-free herds. A herd is declared to be free from tuberculosis when no animal is found to be tuberculous after two annual or three semi-annual tuberculin tests and after thorough physical examination. The subcutaneous test with tuberculin is the one generally practised, but it may be supplemented by the ophthalmic test with tuberculin and the intra-dermal test. There is some evidence to show that the latter method is apparently gaining ground and may in time supersede the subcutaneous test. It is claimed that it relieves the inspector of the drudgery of prolonged observation of temperature. The intra-dermal test causes a reaction in diseased animals, even where repeated subcutaneous injections of tuberculin at short intervals has made them unresponsive to the subcutaneous test; moreover, it can be applied frequently to the same animal without producing immunity to tuberculin. Under this accredited herd system, any animal to be slaughtered is first valued and suitable compensation is awarded. The list of certified tuberculosis-free herds continues to grow in the United States, and from a recent communication from Dr. Frederick Torrance, D.V.Sc., the Veterinary Director-General of Canada, we learn that the system is making good progress also in the Dominion. This country lags behind. The Tuberculosis of Animals Order did good work while it was in operation, but has been suspended since 1914. It is time our authorities gave their attention to its revival or to some alternative scheme such as the one outlined.

SERUM-GLOBULIN AND THE WASSERMANN TEST.

IT has been known for some time that the substances concerned in the various immunity reactions are not found evenly distributed through the sera in which they occur, but that when these sera are split into different fractions the bodies in question are found in conjunction mainly with one or other of them. The same fact applies to antitoxins, and can be utilised in concentrating the total quantity present in a large bulk of serum down to a dose which can be administered without the inconveniences which attach to the making of a large injection. A number of experiments on these lines have been undertaken by various workers in an attempt to throw light upon the Wassermann reaction. Interest in this has been recently revived by the advocacy of the precipitation tests, such as that of Sachs and Georgi, which, it is thought, may give an indication of a syphilitic infection as reliable as the Wassermann reaction and much simpler of performance. Such tests consist in the production of a visible precipitate in the positively reacting sera by various and rather divers agents; a change suggestive of an alteration in the most readily precipitable constituent of serum—the globulins. Kapsenberg,[1] in a recent number of the *Annales* of the Pasteur Institute, has undertaken a reinvestigation of this subject, and confirms the fact that the active substance concerned in the Wassermann test resides in the globulin fraction of the serum. He finds that only when separation of the albumin and globulins is produced by salting-out is the whole of the active substance obtained in the latter fraction; where other methods of separation are employed the substance occurs in both fractions, although chiefly in the globulins. This is probably explicable on the grounds that the process of salting-out produces the most complete separation of these two fractions of the serum, whilst the other methods employed leave considerable traces of globulin in the albumin fraction. These facts being accepted, the further problem arises as to whether the positive reaction in syphilitic sera is due to a mere increase in the quantity of globulin present, or to some alteration in it; closely allied to the last possibility would be the presence of a new and foreign element in the serum, the result of the infective process, which becomes attached, possibly by adsorption, to the globulin at the moment of precipitation, without being an essential part and parcel of it. Noguchi and others claim that there is an actual increase in the amount of globulin present in syphilitic sera, a fact which is not confirmed by Kapsenberg. The treatment of the sera with substances presenting a large and active adsorbing surface has not resulted, in any case, in the diminution of the intensity of the Wassermann reaction, and from this the author inclines to the view that the active substance is an integral part of the globulin molecule; that the latter has suffered a change in the disease, and not that the active body is merely adsorbed by the precipitated globulin; which presumption is supported by the observation already referred to, that anything short of complete precipitation of the globulins fails to remove the active substance from the solution. In the Wassermann test the altered globulins are more readily precipitated from solution than are those of normal sera. In the presence of the lipoid antigens now in use they give rise to precipitates, presenting in the nascent state a surface suitable for the adsorption of comple ment, which thus disappears from the mixture. and a positive reaction results.

ARTHRITIS DEFORMANS OF THE HIP.

IN a paper calculated to upset several time-honoured conceptions with regard to arthritis deformans of the hip, or malum coxæ senile, Prof. Karl Petrén,[2] of Lund in Sweden, bases his discussion on a study of 103 cases observed at his hospital between 1910 and 1920. A scrutiny of these cases, in which the arthritis was confined to the hip, showed among other things that the title malum coxæ senile is misleading. In 8 per cent. the disease had appeared before the age of 40, and only in 13 per cent. had it appeared after 65—an age which Prof. Petrén refuses to associate with senility. Another conclusion to which he comes is that the disease is seldom, if ever, unilateral provided sufficient time has been allowed for it to develop in the second hip. In 61 cases the bilateral character of the disease was demonstrated both by ordinary physical examination and by the X rays. In several other cases one or other of these methods proved the disease to be bilateral, and only in 13 cases did it appear to be unilateral. Closer study of 10

[1] Kapsenberg: Recherches sur le rôle de la globuline dans la réaction de Wassermann, avec une contribution à la technique de la dialyse et à l'exécution du Wassermann, Annales de l'Institut Pasteur, October, 1921.

[2] Acta. Med. Scand., 1921, vol. lv., fasc. iii.

of these 13 cases showed that the average duration of the disease was only 2–3 years, whereas the average duration of the bilateral cases was as great as 4–6 years. Hence the conclusion that, given time, many, if not all, of these unilateral cases would become bilateral. A third subject to which Prof. Petrén gives prominence is the remarkable success which can be achieved by passive movements under skilled supervision. He does not ignore such well-known remedies as massage, salicylates by the mouth, and heat in various forms, but he regards them as secondary in importance to passive movements. These should be so powerful as often to cause considerable pain, but this matters little provided it passes off quickly. As judged by the X rays, the results he obtained were not very impressive. Very different was the functional improvement often obtained, and it is obvious that patients are more interested in improvement they can themselves gauge, than in the cheerless and rigidly objective evidence of skiagrams. Though it is evident that Prof. Petrén has made extensive use of the X rays, he accepts their showings with a healthy modicum of reserve, and as the records of some of his cases show, he does not abandon all hope of restoring mobility to a joint even when the X rays point to "complete synostosis." In one such case passive movements enabled the limb to be flexed about the hip to 20°–30° without the slightest movement of the pelvis; and the patient, a man aged 77, was able to walk with two sticks on his discharge from hospital. It is probable that the immobilisation effected by arthritis deformans of the hip is not due solely to changes in the bones and articular cartilages, but also to a considerable degree to muscular spasm. And this is the component of the forces limiting the movements of the joints which responds so satisfactorily to skilled, systematic treatment.

VETERINARY HEALTH SERVICE IN FRANCE.

THE diminution of over 50 per cent. in cases of rabies notified in Paris and the Department of the Seine for the year 1920 is encouraging, especially as the figures for the four quarters of the year were 144, 108, 47, 34, showing a constant decrease; the 333 cases recorded included 326 dogs, 6 cats, and 1 bear. The total number of cases in France has also been reduced by 1807, giving a diminution of 39 per cent. on the 1919 figures; 2136 persons were bitten by dogs and other animals in 1919, of whom 6 died; only 1403 were bitten in 1920, with 1 death.

The annual report by Prof. H. Martel on the French Veterinary Service of Paris and the Seine Department shows how vigilantly the public health is protected also from other diseases of animal origin in this district. The incidence of tuberculosis in animals does not decrease, and more efforts should be concentrated on methods of prevention. Prof. Martel states that the intra-dermic method of testing for tuberculosis is the one most favoured by cow-keepers. Tuberculosis has been fairly common in pigs, especially those which have been kept in boarding schools, orphanages, and institutions, and the authorities stress the necessity of cooking scraps of human food in order to check the prevalence of tuberculosis in young pigs. The frequency of tuberculosis in fowls is a matter of some import; of 657 fowls suspected and examined 342, or 52 per cent., were found to be tuberculous. The incidence of glanders has increased slightly, but it is gratifying to know that out of 1165 horses and 119 mules imported not one reacted to the mallein test. Great care is taken to cleanse and disinfect trucks used in animal transport by the use of steam and sodium hypochlorite. Damaged and putrefied carcasses have been the chief causes of seizure and destruction of fowls, geese, ducks, turkeys, lambs, goats, pigeons, and rabbits. One of the most noteworthy points in Prof. Martel's report is the good work done in the inspection of the egg supply. It is probable that in this country real benefit would accrue from a thorough examination of the supply of eggs to be offered for sale. In France over 2½ million eggs were thrown out by the inspectors as unfit for human consumption. The shadow test seems to be the one chiefly relied on to discern the quality of the egg. The October supply of eggs was the most faulty, because at this time the preserved eggs are put on to the market. In April exotic eggs are rare, and the country supply shows good quality. Apparently but little bad food escapes the vigilance of the French Veterinary Service, and this important branch of the Public Health Service seems to be very efficiently managed.

BLOOD TRANSFUSION FOR BURN SHOCK.

SEVERE burns occurring in infants and young children are always apt to terminate fatally from shock. In the *Canadian Medical Association Journal* for October Dr. Bruce Robertson has reported encouraging results obtained at the Hospital for Sick Children, Toronto, from transfusion in the treatment of severe burns in children. The greater number of severe burns admitted occurred in children of 4 years and under. The mortality has been high (35 per cent.), not so much from the primary shock as from secondary toxic shock. Weiskotten found in fatal cases of superficial burns characteristic lesions in the suprarenals, lymphatic tissues, and heart muscle "indicating the presence of a more or less specific poison in the circulating blood" (*Jour. Amer. Med. Assoc.*, Jan. 25th, 1919, p. 259). It seems that a toxin is produced in the burned tissue and is thrown into the blood stream. Its action diminishes after about three days. It is significant that all the patients in the hospital who succumbed to shock did so in about 60 hours. Dr. Robertson thinks that in this period treatment should be directed towards neutralisation or elimination of the toxin. The injection of saline and glucose solutions, with the idea of diluting the toxin and of hastening elimination of the toxin, has been tried, but in the more severe cases it fails.

Treatment by blood transfusion or the more radical "exsanguination-transfusion" was tried at the hospital in seven cases. The latter operation is carried out as follows: Blood is withdrawn from the patient until he shows signs of the loss. In infants it may be withdrawn through the fontanelle from the longitudinal sinus. In older children the external jugular or femoral vein or radial artery may be used. It is impossible to obtain much blood from the superficial veins of a child under 5, particularly if the circulation is sluggish. Transfusion is then commenced through the great saphenous vein over the internal malleolus while further exsanguination is being carried out. In an infant only a small amount of blood (up to 120 c.cm.) can be withdrawn before transfusion is begun. But it seems that sufficient blood can be withdrawn until so much toxin is removed as will turn the scales in the patient's favour. The transfusion is carried out preferably with citrated blood. Out of seven cases of severe toxic shock from cases of superficial burns showing symptoms which used to be considered fatal at the hospital, five terminated in recovery. The following is an example. A boy, aged 2½ years, was admitted. Six days before he had fallen into a tub of scalding water. He had been treated at home for second and third degree burns extending over the back from the lower angles of the scapulæ to the upper part of the thighs and forward to the mid-axillary line on each side. He was desperately ill and the extent and severity of the burn were such that the prognosis seemed hopeless. He was exceedingly restless and toxic. 360 c.cm. of blood were transfused immediately. He showed moderate improvement, but the temperature remained high. The restlessness increased and a severe convulsion occurred. Exsanguination (260 c.cm.) and transfusion (400 c.cm.) were performed. The general condition improved, but there was intermittent twitching of the arms and legs, for which mag. sulph. was given subcutaneously. Steady improvement followed. But the toxæmia again increased and the circulation failed. As a last resort blood transfusion (300 c.cm.) was performed. The temperature fell, the general condition improved, and recovery ensued.

DR. Robertson found that examination of the blood and urine in these cases did not give any signs to indicate transfusion. He had to rely on the clinical

points, such as rising temperature and general evidence of increasing toxæmia. A convulsion was a certain indication, but unfortunately a late one. It would be safer not to wait for this. His experience is that if burns are severe enough to cause a convulsion in a child under the age of 2 years it is rare for recovery to take place under any other method of treatment.

SEXUAL REFORM.

THE fact that everyone has, not only sex, but an unequalled knowledge of sexual life in his own person, may account for the sciolism and cocksureness of many popular deliverances upon this topic. Whatever the reason may be for this regrettable tendency, an excellent antidote may be found in the report of the first International Congress for Sexual Reform upon a scientific basis, held recently in Berlin, with an attendance at some sessions of over a thousand. Delegates were present from Italy, Russia, Sweden, Finland, South America, Holland, and other countries, whilst a congratulatory message was read from a French colleague. At this congress the older metaphysical outlook upon sex showed up in contrast with the newer physical outlook, while the conception of original sin gave place to that of congenital defect. The ancient idea—recently emerging from temporary obscuration—that the significance of sexual love does not end with its biological consequence of reproduction, but that it is a pre-condition of mental and physical life harmony, received emphasis. While admitting that permanent monogamous union had been evolved by the constructive force of Western civilisation, it was held by a section of the congress not to be well suited to eugenic ends, and its eventual modification, under safeguards, to a form eugenically more appropriate was discussed. The hindrances in the way of making people moral by Act of Parliament are certainly enhanced by the likelihood that the primitive sex impulse will always find itself in some measure opposed to current legislation. The difficulties besetting birth control were frankly recognised. Limitation of proletarian fertility would be difficult to effect, even by de-penalising abortion; a better means of meeting the disadvantages might be to enact that childless couples should bequeath a part of their property to the State. The desirability of legalising the interruption of pregnancy within the first three months was considered, but the neo-Malthusian method of prevention, rather than interruption, of pregnancy, was recognised as preferable. Sterilisation of degenerate criminals and lunatics was held to be advisable, at all events as a temporary measure.

Other thoughts which were current at the congress may be thus summarised. Sexual pædagogy should entail reform of education, with strict regard to formation of character, moral autonomy, and the sense of responsibility. Extremes are to be avoided. There must be no Thelemite laissez-faire, no blinking of juvenile sexual proclivities, no blind following of Freud. Puberty in boys hindered intellectual development, but in girls furthered it. A worker from the Berlin Institute of Sexual Science described "schizoid" types of human constitution, marked by inconstant sexual characters, verging even on asexuality, and often coinciding with somatic or endocritic stigmata like those found with true sexual inversion. There was in these types some approach to a schizophrenic psychosis, which, as Freud had shown, generally betrayed a conflict for survival between latent sexual desires and the collective psychical personality as moulded by its environment. The report of the congress is valuable as containing recent verdicts on Steinach's well-known work. Objection was taken to attributing the source of sexual hormones to the interstitial cells of the primary reproductive glands, and not to the endocrine system as a whole. It was stated that the amphibia had no interstitial tissue in ovary or testis, and yet showed well-marked secondary sexual characters. Notes were submitted of 37 patients, vasectomised more than a year previously with the object of rejuvenation, all of whom showed improvement in that respect without injury to their general health. On the other hand, castration followed by testicular implantation, in order to remedy inverted sexual desire, had uniformly failed. It seemed as though after puberty sexual aim became fixed in the central nervous system, although an alternative explanation of ill-success might be found in the extreme rarity with which organs implanted into human beings retained their vital activity. The congress, as was to be expected, held widely variant opinions, some of them obviously devoid of balance, and it can hardly be doubted that the atmosphere of public discussion will have exerted a useful check on extreme views. In this connexion it may be mentioned that the monthly journal of the Malthusian League, after appearing for 45 years as the *Malthusian*, is to be widened in scope, and to reappear in the New Year as the *New Generation*. The next congress will be held at Rome.

VINCENT'S DISEASE.

VINCENT'S disease, a comprehensive term including all the localisations of the fuso-spirillar symbiosis, forms the subject of a review in the December number of *Medical Science* by Dr. J. D. Rolleston, who quotes several recent articles showing that the disease has been unusually prevalent in Germany since the war. No satisfactory explanation of this occurrence has yet been offered, for while some writers attribute it to under-nourishment and a general decline of personal cleanliness due to lack of soap and heating material, others note its predilection for vigorous young persons of both sexes, and also point out that it did not become prevalent until 1919, when the supply of food was much more plentiful and richer in vitamins than during the last years of the war. Among the unusual localisations of the fuso-spirillar symbiosis reported by recent writers, reference is made in the review to the cases of infection of the thumb recorded by Hennessy and Fletcher in THE LANCET,[1] auto-inoculation of the skin of the anal region described by Koslowsky, infection of the external auditory meatus and middle ear related by various British otologists, and lastly an example of ulcerative and gangrenous balano-posthitis. The coexistence of Vincent's angina with syphilis or diphtheria is discussed, in reference to a case reported by Souchet in which the clinical and bacteriological appearances were those of Vincent's angina; here it was not until the development of a cutaneous eruption that the suspicion of syphilis arose and was confirmed by the presence of the *Spirochæta pallida* and a positive Wassermann reaction. Dr. Rolleston suggests that such complications as renal disease, myocardial changes, and peripheral palsies, which Reiche describes in his cases of Vincent's angina, were probably due to a coexistent diphtheria having been overlooked. Various topical applications for Vincent's disease, such as trypaflavin in the form of a ½ per cent. spray, a 10 per cent. solution of salicylic acid in equal parts of alcohol and glycerine, or pyoktanin in 1 per cent. solution have recently been recommended, but most writers still favour preparations of salvarsan such as neosalvarsan or silver-salvarsan for local application or intravenous injection.

MOTHS AS PESTS IN THE PHARMACY.

FROM time to time stocks of drugs become infested by animal pests such as mites, beetles, ants, and moths. The harm done by moths in particular was the subject of a paper read on Dec. 14th before the Pharmaceutical Society of Great Britain by Mr. T. E. Wallis, B.Sc., F.I.C., lecturer in botany. Recently the larvæ of the pyralid moth *Corcyra cephalonica* Stt. were found attacking many of the dry goods in a pharmacy at Hastings. The maggots showed themselves catholic in their tastes and had eaten starch, poppy-heads, whole and crushed linseed, powdered

[1] THE LANCET, 1920, ii., 127.

fennel fruit, chamomile flowers, senna leaves and fruits, and a number of bunion plasters. This moth is well known as a pest of flour and grain, being especially common in rice. In general appearance it resembles a clothes-moth, but it actually belongs to the group Pyralidina, of which the flour-moth, *Ephestia kühniella* Zeller, is also a member. *Corcyra cephalonica* was first described in 1865, having been found in some dried currants by Mr. Hind, of York. The name *Corcyra* was given to the moth because it was thought to have been imported from Corfu, where currants are cultivated. The moth is of Eastern origin, and was brought to Europe by the rice trade. *Ephestia kühniella* is a closely related species of similar general appearance, and was carried to Europe from America as a result of commerce in grain and meal. It was formerly erroneously known as the Mediterranean flour-moth. Its larva is stout in build and has a pinkish tint, while the larva of *Corcyra* is more slender and dull whitish in colour. A third moth, *Borkhausenia pseudospretella* Stt., belonging to the family Tineina, which includes also the common clothes-moth, was found a short time ago in large numbers in a specimen of valerian root, which had been partly reduced to powder by the ravages of its larva. This moth was introduced from America about the year 1840 and is now a common inhabitant of houses, feeding upon parts of plants, skins, seeds, and the like. All these moths show a complete metamorphosis, and in every case it is the larvæ with their strong biting jaws which attack the drugs, while the moths have suctorial mouths and are unable to feed upon hard materials. The most satisfactory method of exterminating these pests is the application of heat. A temperature of 60° C. (140° F.) maintained for 15 minutes will destroy eggs, caterpillars, and moths. When large bags of drug are being dealt with, it is necessary to ensure that the required temperature is reached at the centre of the bags, and this can be readily arranged by heating the store containing the bags by air driven over steam-pipes for a period of two or three days, as suggested by A. W. Knapp for the treatment of cocoa. Fumigation with carbon bisulphide vapour is moderately successful in getting rid of the moths, but does not so effectually destroy the eggs; in a trial experiment made upon a large scale, only 50 per cent. of the larvæ were killed. Other fumigating agents such as formaldehyde, carbon tetrachloride, and trichlorethylene have been tried with indifferent result. A knowledge of these things may save the contents of the doctor's drug store.

ARTIFICIAL PNEUMORACHIS IN MENINGEAL INFECTIONS.

AT a recent meeting of the American Neurological Association Dr. Edward Affleck Sharp,[1] of Buffalo, N.Y., remarked that injection of air or oxygen into the ventricles of the brain had become a recognised procedure in neurological and surgical diagnosis. Injection of air or oxygen into the subarachnoid space by lumbar puncture producing an artificial pneumorachis had also been found of value in the treatment of acute infection of the meninges. During an epidemic of meningococcus meningitis in 1916–1917 a few cases occurred in which the purulent fluid was obtained with difficulty owing to adhesions or blocking of the vertebral canal. Injections of half-strength normal saline diluted the fluid and broke down adhesions, permitting a free flow of the purulent fluid. In some of these cases oxygen was injected and an additional quantity of purulent fluid was evacuated before injection of antimeningococcal serum, the oxygen in such cases probably acting only as a mechanical agent in displacing the fluid and opening up secluded pockets of adhesions and not possessing any germicidal action. The average amount of oxygen introduced was from 10 to 15 c.cm. No bad effects have ever resulted from the oxygen injections. During the last four years Dr. Sharp had treated 64 cases by this method. Of these 30 were cases of meningococcus meningitis, of which 23 recovered and 7 died; 12 were cases of tuberculous meningitis, of whom 3 recovered and 9 died; 10 were cases of lethargic encephalitis, of whom 8 recovered and 2 died; 2 were cases of anterior poliomyelitis, which both recovered, and 10 were cases of pneumococcus, streptococcus, or typhoid meningitis, which were all fatal. Dr. Sharp points out that the mortality of 23 per cent. among the cases of meningococcus meningitis compares very favourably with the statistics of cases of meningococcus infection in which antimeningococcus serum alone was used, especially as the new method was confined to the severe and apparently unfavourable cases. The paper was illustrated by a skiagram showing that oxygen injected by lumbar puncture may reach the ventricles, spread over the cerebral cortex in the subarachnoid space, and fill the cisterna magna.

[1] Archives of Neurology and Psychiatry, December, 1921.

DENTAL REGISTRATION.

ANY dentist, or person who believes himself entitled to registration under the Dentists Act, 1921, who desires to know his rights and obligations under that statute, cannot do better than acquire Sir Kingsley Wood's small but comprehensive volume.[1] It does not, of course, explain or embody regulations not yet approved and which had not been even discussed by the Dental Board when it was written, but it explains clearly the Act so far as it goes and the effect of its sections. It includes a brief survey of the Dentists Act of 1878, and contains the text of that statute as well as that of the new Act. The explanations given appear to be ample for their purpose at this stage, and should call the attention of those concerned to many points which otherwise might escape their notice. The knowledge of the law which, as British subjects, we are all assumed to possess does not always carry with it the power accurately to interpret the meaning of a Parliamentary draughtsman, or help us to follow his references to preceding legislation.

It has been pointed out to us that in a recent leading article upon the new Dental Board the references to the position of the Royal College of Surgeons of England are not accurate. The evolution of professional dentistry is a long story of which we could only give an abstract. A principal part was played by the Odontological Society when representations brought about the granting of a charter, but the charter was not granted to the Society, but to the Royal College of Surgeons, empowering the College to institute a Department in Dental Surgery.

[1] Dental Registration, being a Practical Guide to the New Dentists Act, by Sir Kingsley Wood, M.P., a Solicitor of the Supreme Court, Honoursman and John Mackrell Prizeman, Law Society. London: Baillière, Tindall and Cox. 1921. Pp. 136. 5s.

THE Trustees of the Beit Memorial Fellowships for Medical Research have elected the following candidates to Fellowships of the annual value of £400:—

Mr. Robert Keith Cannan, M.Sc., for research into some chemical aspects of metabolism and digestion, at University College, London.

Mr. Herbert Davenport Kay, B.Sc., for research into the degradation of carbohydrates and allied substances by micro-organisms, at the Lister Institute.

Dr. Mary Kathleen Forsaith Lander, for research on the evolutionary process of development of stereoscopic vision and conjugate movements of the eye, at University College, London.

Dr. Harry Goldblatt, for research on the quantitative relation of fat-soluble A deficiency to the development of experimental rickets, and on the effect of parathyroidectomy on immunity, at the Lister Institute.

Dr. Louis Gross, for research on intestinal stasis, at the Royal College of Surgeons and London Zoological Gardens.

Dr. Ethel Marjorie Luce, for research on accessory food factors, with special reference to the relationship of ductless glands to calcium metabolism, at the Lister Institute.

Prof. T. R. Elliott, F.R.S., has been appointed a member of the Advisory Board.

PLAGUE ON BOARD SHIP.

BY W. W. CLEMESHA, C.I.E., M.D., D.P.H.,
LIEUTENANT-COLONEL, I.M.S. (RET.)

THERE is no necessity to apologise for bringing this very important subject again before readers. Recent outbreaks of plague in many parts of the world are in all probability re-importations of the disease caused by infected ships' rats. The reason for this re-importation is probably to be found in the general lack of vigilance due to reduced staff, which was a necessary result of the war. Dr. W. M. Willoughby, Port Health Officer of London, has published several papers on the subject of plague epidemics in ships that have come under his cognisance; an exhaustive account of the outbreaks on shipboard that have occurred since the year 1896 appears in a report by Dr. R. J. Reece, of the Ministry of Health. During the years 1917–20 Dr. Willoughby reports that eight plague-infested vessels were seen by him in London; as a result of very careful inquiry he came to the important conclusion that, as a general rule, the earliest case amongst human beings on an infected ship is the storekeeper, whose business it is to issue rations for the ship's company. Out of 1715 persons exposed to infection on eight infected vessels 39 developed plague; no less than eight of these occurred amongst storekeepers and their assistants. Dr. Reece says, "the storekeeper who gets up the food for the native crew and the saloon steward who carries the food from the galley to the saloon are specially liable to infection." The cause for this state of affairs is, as suggested by these writers, that ships' rats require both food and water, and in search of these necessities they invade the store-room, and not infrequently the lavatories of the ship. Early cases amongst lavatory attendants have also been reported.

Eight plague-infected ships in a matter of four years may not seem a great number in so large a Port as London, but the all-important question suggests itself: If eight ships were discovered, how many were actually infected but escaped detection? In endeavouring to reply to this query, recent work on the epidemiology of plague will be of much assistance.

Difficulty Concerning Ships Apparently Healthy.

All who have had any experience of port health work will agree that it is only in regard to ships that have had cases of sickness or deaths amongst the crew that suspicion is at all likely to arise in the mind of ships' officers, who supply information to the visiting health officer. If rat mortality has occurred without human cases it might be noticed and reported, but an odd dead rat on a ship is no very uncommon sight, and very likely would escape notice or be forgotten. If no human cases occurred and no dead rats were found, the ship would be reported, in all good faith, as healthy; being classed as free from infection, unloading would take place at the wharf in the ordinary way. Possibly dead rats would be found on moving the cargo, but by that time the damage might be done and some infected rats have escaped ashore.

The "Plague Season."

Now it is well established that the fulminating epizoötic of plague in a rat-infested town in the tropics only takes place at a time when flea prevalence on the rats is at its height, and when climatic conditions give the maximum period of infectivity for the flea. These conditions constitute what may be called the "plague season"; when they are absent we get an entirely different type of outbreak amongst rats. It has been shown by Kunhardt and Chitre that if plague infection is brought into a rat community in the "off season"—that is, when the flea prevalence per rat is greatly reduced and the temperature is either too high or too low—only dropping cases occur amongst the rats, but the infection may be kept alive in this way for months. Applying these facts to outbreaks on board one would expect to find both varieties amongst ships' rats. From Dr. Willoughby's figures it would appear that both types have been recorded; in two out of eight boats (the *Sardinia* and the *Clan Lamont*) no dead rats were found amongst the cargo—this would be very unlikely to occur in the explosive type of outbreak. Again, in Dr. Reece's valuable report we read, "There have been several instances that seem to indicate that the period during which rat plague may exist on board a vessel before its presence is discovered may be a long one." Then follows the details of the outbreaks of the ships *Highland Prince*, *Nankin*, and *Moora*. The complete facts of these outbreaks may well be studied in the report, but of the *Nankin* and *Moora* the author says, "It may be that infected rats concealed in merchandise found their way on board both vessels at Bombay and that the disease for some unexplained reason did not assume epidemic proportions among the rats for two months." Given certain conditions of flea prevalence, low temperature and humidity, a delayed epizoötic would result. This is the correct explanation of the remarkable course of events on these two ships. Unfortunately, there are no figures available showing the average number of fleas per rat in those captured or destroyed on board ship, but it may be held that there is doubt as to whether the flea prevalence on ships' rats is ever as great as it is on land. Obviously fleas must breed in the ship's hold, but it is very doubtful whether the conditions under which they live are as satisfactory as they are ashore. Flea prevalence fluctuates with climatic conditions even on land rats; the same must also apply to ships' rats. Many of the boats pass out of the tropics into colder climates three or four times in the year; this would certainly have a restraining influence. It is fair, therefore, to conclude that plague infection on shipboard does assume much the same phase as is known to exist in Indian villages in the "off season," and that in this state it is very likely to escape detection because the rat mortality is small and the chances of human infection much reduced.

The Small Freighter as a Rat Carrier.

Five out of eight of Dr. Willoughby's ships and at least 60 out of 109 of Dr. Reece's were big passenger vessels with voluminous and well-stocked food store-rooms. Frequently, there would not be much in the cargo that would prove attractive to rats as food, but a reference to the reports shows that occasionally these ships did carry grain. This brings us to the last point. Only a comparatively small proportion of the world's trade is carried in large passenger ships; the small freighter of 5000 to 10,000 tons is much more numerous, and is, therefore, a more important factor in the spreading of disease. Let us try to imagine the conditions on a vessel of this size carrying a cargo of grain. Grain coming from a plague-infected country like India in itself constitutes a grave source of danger. At this point I do not turn aside to discuss the whole question of the grain trade and its influence in the spread of plague; suffice it to say that the most recent work has shown that wherever there is a big grain trade, there plague constantly manifests itself. Broadly speaking, re-importation of the disease follows importation of foodstuff. In a boat of the type described, where the whole cargo provides food for rats, the necessity for them to have recourse to the crews' food-supply is considerably reduced; consequently the chances of infecting members of the crew would be lessened. Assuming that infection was brought on board at an inopportune moment, when the flea prevalence per rat was low and climatic conditions adverse, one might further amplify the picture by adding that the rats were the grey rat and the fleas *Xenopsylla astia* (vide the recent work by Cragg). The result would be a slow creeping outbreak of the endozoötic type, that would very likely pass unnoticed and might not cause any human cases. Under the circumstances described above what would be the chance of detecting the presence of infection on a ship?

Probably it would be extremely remote. Further, long experience of port health work and careful study of the literature of plague outbreaks go to show that the picture drawn above represents what actually occurs on some considerable scale throughout the world.

Wherever there is trade in grain from infected ports plague almost invariably follows sooner or later. In the reign of Justinian the disease was carried from Egypt to Byzantium by grain-ships. The same forces are still at work to-day. The more we know of the epidemiology of plague the easier is it to see how slight may be the chances of detecting its presence. It may be held, therefore, that all ships carrying grain, or those in whose cargo food forms a large part, should be Claytonised whenever the ship is empty. For a grain-ship to carry rats is a danger to the world.

THE INTERNATIONAL STANDARDISATION OF SERA:

AN IMPORTANT CONFERENCE.

A CONFERENCE was opened by permission of the Government at the Ministry of Health on Monday, Dec. 12th, at which the Health Committee of the League of Nations discussed the international standardisation of sera. The Conference, the personnel of which we gave last week, had not arrived at any conclusions in time to allow their publication. The conclusions of the various sub-committees were received in plenary Congress on Wednesday, Dec. 14th, and their reports on the international standardisation of sera in connexion with diphtheria and tetanus, meningococcus and pneumococcus, dysentery, and syphilis are appended.

THE RECOMMENDATIONS OF THE SUB-COMMITTEES.

I.—*Sub-Committee for Anti-Diphtheritic and Anti-Tetanic Serum.*

(Chairman: Dr. Louis Martin.)

The Committee for investigating methods for testing the potency of anti-diphtheritic and anti-tetanic serum considers it both possible and desirable to fix for both these sera an antitoxin unit which could be generally accepted and acknowledged as an International Unit.

Diphtheria Antitoxin.—Two units are used at present:—

(*a*) The German, determined in the Frankfort Institute for Experimental Medicine following the Ehrlich method with standard serum, and

(*b*) The unit determined in the Public Health Bureau at Washington.

Between these two units, according to the experiments carried out to date, there are only very small differences. To determine these differences accurately the standard sera and test-toxins for the necessary researches will be given to the various participating institutes both by the Frankfort Institute for Experimental Medicine and the Washington Public Health Bureau.

The result of the experiments performed with these sera and toxins at the several laboratories represented will be delivered on completion to the Danish State Serum Institute, which for this purpose will act as the central laboratory.

Tetanus.—Four methods at present are employed to describe the potency of anti-tetanic toxin. These four methods start from different points of departure and experiments have not yet determined the exact relation between the units determined by each of these methods.

The Committee consider, however, that it is desirable and possible to establish a common measure by an agreement on a single standard antitoxin, using the principle which has been adopted in connexion with the standardisation of anti-diphtheritic serum.

In the first instance the participating laboratories must fix experimentally the relations which obtain between the four units at present employed.

With this object an exchange of sera and toxins will be made in order to secure the necessary comparative experiments. The details of the experiments made with each method will in all cases be described in precise detail. All the relative documents will be sent to the Danish State Serum Institute which for this purpose will act as the central laboratory and the results will be discussed at a subsequent conference.

II.—*Sub-Committee for Antimeningococcus and Anti-pneumococcus Serum.*

(Chairman: Dr. Dopter.)

(*a*) *Antimeningococcus Serum.*—The Sub-Committee have unanimouly agreed as follows:—

1. With the object of obtaining full information regarding the various types of meningococci, the several laboratories mutually agree to exchange agglutinating serums and strains of meningococci, the latter being obtained exclusively from the cerebro-spinal fluid of meningitis cases.

2. Macroscopic methods will be employed in agglutination investigations, the bacterial emulsions having been kept for 24 hours at a temperature of 37° C., without prejudice to other methods which may also be employed. Investigations into the saturation of agglutinins may be carried out by any method.

3. In the existing state of our knowledge and without prejudice to the opinions of the several institutes participating in these researches and who are not represented at this conference it appears to be difficult to determine the therapeutic value of antimeningococcus serum by measurement of agglutinins, sensitisers (sensibilisatrices), and opsonins.

4. Fresh experiments will be undertaken in the various laboratories regarding the value to be attached to the determinations of antiendotoxic and bactericidal power.

(*b*) *Antipneumococcus Serum.*—The Sub-Committee have unanimously arrived at the following conclusions:—

1. A mutual exchange of cultures of different strains of pneumococci will be effected in the same manner as agreed upon in the case of meningococci.

2. Researches into the agglutinating power of anti-pneumococcus serum is of no value in determining its therapeutic power. The best method of titrating the serum is the measurement of the bacteriacidal power in animals, preferably mice.

3. New investigations will be carried out with regard to (*a*), the best method of inoculation—peritoneal or subcutaneous—for the titration of serum; (*b*) the selection of methods, preventive or simultaneous, for the injection of serums and cultures; (*c*) the monovalence or polyvalence of the different serums.

III.—*Resolutions Adopted by the Committee on Dysentery Serum.*

(Chairman: Prof. Kolle.)

1. It was agreed that it would be advisable that the different institutes, laboratories, &c., should exchange samples of serum and toxin and that further experiments should be carried out, using for these—

(*a*) Different methods of titration,

(*b*) Different species of animals.

2. In testing the potency of sera, there was a general agreement that the antitoxin, especially the antiendotoxin, should be estimated, and there was general agreement that this could be accurately carried out equally well with dead bacilli as with toxin. In reference to the method of testing the dysentery serum on mice, it was recommended that a series of tests should be carried out with the standard serum which the Frankfort Institute would supply, comparing them with methods in use in the various institutes, and that a report on these experiments should be presented at the next Conference. But it was considered that it was advisable also to test the anti-microbic power of serum, employing living bacilli for the test.

3. It was unanimously agreed that in the preparation of experimental anti-Shiga serum, the horses should be inoculated with the *B. dysenteriæ* (Shiga) only.

4. It was agreed that the question of the preparation and the standardisation of sera prepared from various other atoxic dysentery bacilli should not be discussed, as the actual state of our knowledge does not permit us to solve the question in a decisive manner.

IV.—*Sub-Committee on the Sero-diagnosis of Syphilis.*

(Chairman: Prof. Bulloch.)

The recommendations of the Committee appointed to discuss this question are:—

1. In a certain number of institutes the Wassermann reaction as practised in them should be compared with the methods of Sachs-Georgi, Meinicke and Dreyer-Ward ("Sigma").

2. The number of cases examined in each institute should be 1000 of undoubted syphilis, and 1000 in which syphilis could be excluded as far as possible.

3. It is also recommended that the different methods should be compared on about (one and the same) 50 cases out of the 1000, at different stages of the disease. These repetition tests should be carried out on at least three or four occasions in the course of the disease, and it is recommended that the 50 cases should comprise especially suspected syphilis of the nervous system and of the eye.

4. The worker should be allowed the opportunity of studying the respective authors' own methods in the respective institutes.

5. The places where the tests are to be carried out should be efficiently equipped, and the serologist should be in as close touch with the clinician as possible.

6. For the flocculation tests the serologist should use only those extracts prepared or controlled by their respective authors.

7. The samples of serum to be tested should be known only by numbers, and the serologist should not have access to the clinical or pathological records until the whole series of tests is concluded, but the chief of the laboratory may cause any serum to be retested without making the serologist aware of the fact.

8. A preliminary report to be submitted after the first 500 tests have been concluded.

9. All reports on tests should include information as to—
(*a*) Reliability of the method,
(*b*) Complexity of technique,
(*c*) Relative consumption of time by the method,
(*d*) Expense,
(*e*) Ease and accuracy with which the reaction can be observed,
(*f*) Percentage of dubious results,
(*g*) The extent to which the method yields quantitative results.

It is recommended that all the results should be finally submitted to the State Institute for Seropathy of Copenhagen.

A LUNCHEON TO THE DELEGATES.

On Wednesday Sir ALFRED MOND, the Minister of Health, presided at a luncheon given by the Government to the delegates to the Conference. The luncheon was held at the Carlton Hotel and the guests were grouped at separate tables, the occasion being a purely social one, at which the great work being done by the Health Committee of the League of Nations could be publicly recognised. There were but two speeches, one by the Minister of Health welcoming the company, and the other a reply by Prof. Madsen, the President of the Health Committee.

Sir ALFRED MOND said that he was particularly glad that the delegates to discuss matters of international health had not been drawn exclusively from the countries within the League of Nations, although the Conference was being held under the auspices of that League. He spoke eloquently of the part which medicine would necessarily play in the great work of reconstruction before the world.

Dr. MADSEN, in reply, disclosed certain of the conclusions which had been arrived at by the sub-committees, and considered that the results of the first conference had been very successful. Unanimous agreements had been arrived at with regard to certain important therapeutic sera, and machinery had been indicated by which comparative results could be obtained for further study. He made special reference to the valuable assistance which had been given by the British Ministry of Health to the work of the Health Committee of the League of Nations in placing at the disposal of the committee the services of the senior medical officer Dr. G. S. Buchanan as adviser, Dr. F. Norman White as chief epidemic commissioner, and Dr. E. J. Steegmann as secretary. Dr. Steegmann's appointment was a temporary one, and he has since been succeeded by Dr. Rajchman. Dr. Madsen also referred to the invaluable aid rendered in reference to the particular work in hand by the Medical Research Council. He spoke in fluent English.

The following guests were present:—
Sir T. Clifford Allbutt, Sir F. Andrewes.
Sir P. W. Bassett-Smith, Surgeon-General Rupert Blue, Sir A. Bowlby, Mr. L. G. Brock, Dr. G. S. Buchanan.
Sir Mackenzie Chalmers, Major-General Sir Havelock Charles, Dr. S. A. M. Copeman, Dr. Cotoni, Dr. F. J. H. Coutts.
Dr. H. H. Dale, Mr. J. Conway Davies, Lord Dawson of Penn, Prof. H. R. Dean, Dr. R. Doerr, Dr. Dopter, Captain S. R. Douglas, Prof. G. Dreyer.
Dr. A. Eastwood, Mr. F. W. Emett.
Sir Walter Fletcher.
Dr. M. H. Gordon, Mr. B. Gosio.
Dr. W. H. Hamer, Colonel L. W. Harrison, Dr. L. Hirszfeld.
Viscount Knutsford, Dr. W. Kolle.
Major-General Sir W. Leishman.
Dr. T. Madsen, Prof. C. J. Martin, Dr. Louis Martin, Dr. M. Miyajima, Sir Norman Moore, Dr. R. Mueller.
Sir George Newman, Colonel Perrin Norris.
Mr. R. A. O'Brien.
Dr. L. Rajchman, Dr. G. Renaux, Sir William A. Robinson.
Mr. H. Sachs, Prof. C. S. Sherrington, Sir Squire Sprigge, Colonel P. G. Stock.
Mr. Douglas Veale.
Dr. F. Norman White, Sir Dawson Williams, Sir G. Sims Woodhead.

It is understood that the Conference will meet again in six months' time, probably at the Pasteur Institute in Paris, to report progress and arrive at further recommendations for the organisation of international health matters. In the meantime the work of the sub-committees goes on.

KING EDWARD'S HOSPITAL FUND FOR LONDON.

A MEETING of the General Council of King Edward's Hospital Fund for London for the purpose of awarding grants was held on Dec. 14th, Viscount FINLAY (Member of the President's Powers Committee) being in the chair.

Lord REVELSTOKE, hon. treasurer, said that the amount received for general purposes to Dec. 3rd, 1921, was £221,326. This exceeded the total indicated in the estimate laid before the Council in November, the increase being due to the generous action of King George's Fund for Sailors in again providing the amount of the grant of £5000 to the Seamen's (Dreadnought) Hospital. The legacies received during the last 11 months amounted to £74,000, as against £18,000 in 1920, and the Council had decided to distribute a portion of these additional receipts, and to keep a portion in reserve, thus effecting a reasonable compromise between an endeavour to afford every possible assistance to the hospitals during this year, and an equal desire to maintain a regular distribution as a stabilising influence and element in their finance.

Lord REVELSTOKE then read the following communication from Lady Mount Stephen:—

"I have been allowed to tell you by the executors that my husband has left the residue of his fortune to King Edward's Hospital Fund. It is, I believe, practically nearly the whole of his fortune, for the legacies, &c., in proportion do not amount to anything of importance. Would you, as Treasurer of the King's Fund, make this known to the Council?"

Viscount FINLAY moved a resolution recording the deep regret of the General Council of the Fund at the death of Lord Mount Stephen, to whose benefactions the Fund and the sick poor of London owed so much. His gifts to the capital of the Fund during his lifetime amounted to some £500,000.

The resolution was seconded by the Governor of the Bank of England, put from the chair, and carried unanimously.

Sir WILLIAM COLLINS, in making the annual statement on behalf of the League of Mercy, said that so far as he could say the League would be in a position to make a contribution of £14,000, possibly more, making a total from its foundation of £323,034 to the voluntary hospitals of London through the King Edward's Fund, and, including extra Metropolitan hospitals, £360,429. The new scheme, originally suggested by Lady Hall, for collections from people in domestic service, had already brought in £200 or £300 during the current year, and they hoped great things of it.

Report of the Distribution Committee.

Sir COOPER PERRY (the chairman of the Distribution Committee) presented the report of that committee, which announced that the amount placed at the disposal of the Distribution Committee for allocation amongst hospitals at the present distribution was £210,000. The amount distributed last year at the

ordinary distribution was £190,000, apart from the emergency distribution of £250,000 made by the Fund in July, 1920, out of its accumulated funds, and the special distribution of £250,000, which was generously entrusted to the Fund by the British Red Cross Society and the Order of St. John of Jerusalem for distribution on their behalf in aid of schemes of extension or improvement at hospitals able and willing to treat ex-Service men. The number of hospitals applying was 110, as against 108 in 1920.

The report dealt at some length with the findings of Lord Cave's Committee and the duties which fell upon the Distribution Committee when King Edward's Hospital Fund was constituted the Voluntary Hospitals Committee for London. The Distribution Committee held a series of special meetings with the object of making specific recommendations to the Voluntary Hospitals Commission, and, as a result, grants were made to 24 hospitals which were in imminent danger of closing down. The Distribution Committee notified the hospitals that grants in aid of capital expenditure would have to be severely limited, but as a set-off total grants to maintenance were considerably increased.

The committee recommend that the following grants, made in past years in aid of schemes of building expenditure, should be renewed under the two years' rule: City of London Hospital for Diseases of the Chest, £500 to improvements; General Lying-in Hospital, £3000 to rebuilding on new site; Royal Northern Hospital, £2500 to new nurses' home; London Lock Hospital, £4500 to reconstruction of the Harrow-road Hospital, of which £3000 to be available for out-patient department; Queen Charlotte's Lying-in Hospital, £3100 to new out-patient department and other improvements; Queen Mary's Hospital for the East End, £1625 to improvements; Queen's Hospital for Children, £2538 12*s.* 11*d.* to improved out-patient accommodation; St. Mary's Hospital for Women and Children, Plaistow, £5500 to new nurses' home and out-patient department; St. Monica's Hospital, £100 to improvements; St. Peter's Hospital for Stone, £200 to improvements; St. Thomas's Hospital, £2500 to extension of nurses' dining-room; Victoria Hospital, £450 to new heating apparatus, transferred to extension of out-patient department and resident medical officers' quarters; West London Hospital, £4000 to improvements; Woolwich and District War Memorial Hospital Building Fund, £5300 to new general hospital.

The grants recommended by the Distribution Committee were presented by Sir FREDERICK FRY (hon. sec.) as follows:—

List of Awards.[1]

Acton Hospital	£110
Beckenham Cottage Hospital	55
Belgrave Hospital for Children	1200
Blackheath and Charlton Hospital (£25 of the grant to improved kitchen accommodation)	175
Bolingbroke Hospital	500
British Hospital for Mothers and Babies, Woolwich (£1000 of the grant towards the building of the amalgamated hospital, in accordance with the scheme submitted to the Fund)	1150
Canning Town Women's Settlement Hospital (£100 of the grant to reduce debt)	650
Central London Ophthalmic Hospital	400
Central London Throat and Ear Hospital (£250 of the grant to recent improvements in nurses' accommodation)	350
Charing Cross Hospital	4350
Chelsea Hospital for Women	550
Cheyne Hospital for Children	160
City of London Hospital for Diseases of the Chest, Victoria Park	3000
City of London Maternity Hospital	775
Clapham Maternity Hospital	300
Dreadnought Hospital, Seamen's (the amount of the grant this year is being generously given by King George's Fund for Sailors, as a temporary measure, earmarked for the Seamen's Dreadnought Hospital)	5000
East End Mothers' Lying-in Home (£50 of the grant to additional nurses' accommodation)	650
East Ham Hospital	£50
East London Hospital for Children	3000
Elizabeth Garrett Anderson Hospital	1000
Eltham and Mottingham Cottage Hospital	80
Evelina Hospital	1000
Finchley Cottage Hospital (£250 of the grant to extension, in accordance with the scheme submitted to the Fund)	350
Florence Nightingale Hospital for Gentlewomen (£100 of the grant to reduce debt)	325
French Hospital	200
General Lying in Hospital	550
German Hospital	—
Grosvenor Hospital for Women	775
Guy's Hospital (£500 of the grant to improvements in nurses' accommodation, in accordance with the scheme submitted to the Fund)	12,500
Hampstead General and North-West London Hospital	2750
Hendon Cottage Hospital	225
Hornsey Cottage Hospital	100
Hospital for Consumption, Brompton, including Sanatorium at Frimley	2000
Hospital for Diseases of the Throat	150
Hospital for Epilepsy and Paralysis	1750
Hospital for Sick Children (£400 of the grant to additional nurses' accommodation, in accordance with the scheme submitted to the Fund)	4900
Hospital for Women, Soho-square	1000
Hospital of St. John and St. Elizabeth	750
Infants' Hospital (£250 of the grant to reduce debt)	750
Italian Hospital	350
Kensington and Fulham General Hospital	30
Kensington Dispensary and Children's Hospital	30
King Edward Memorial Hospital, Ealing	575
King's College Hospital	7750
London Fever Hospital	250
London Homœopathic Hospital (£250 of the grant to reduce debt)	1500
London Hospital (£1000 of the grant to deficit on new nurses' home, in accordance with the scheme submitted to the Fund)	14,250
London Lock Hospital (£700 of the grant to maintenance of Harrow-road Hospital, and £50 to maintenance of Dean-street Hospital)	750
London Temperance Hospital	2200
Maternity Charity and District Nurses' Home, Plaistow (£500 of the grant to rebuilding and extension, in accordance with the scheme submitted to the Fund)	800
Metropolitan Ear, Nose and Throat Hospital	30
Metropolitan Hospital (£1000 of the grant to reduce debt)	4600
Middlesex Hospital (£250 of the grant to improvements to operating theatre)	7850
Middlesex Hospital Cancer Charity	850
Mildmay Memorial Hospital	525
Mildmay Mission Hospital	975
Miller General Hospital for South-East London	3500
Mothers' Hospital of the Salvation Army	750
National Hospital for Diseases of the Heart	500
National Hospital for the Paralysed and Epileptic (£2000 of the grant to reduce debt)	4750
Nelson Hospital, South Wimbledon (£400 of the grant to extension, in accordance with the scheme submitted to the Fund)	850
Northcourt Hospital and Home for Sick Children, Hampstead (grant given in consideration of the fact that curable cases are admitted)	50
Norwood Cottage Hospital	500
Paddington Green Children's Hospital	850
Passmore Edwards Hospital for Wood Green, &c.	75
Poplar Hospital for Accidents	100
Prince of Wales's General Hospital (£2000 of the grant to reduce general fund debt)	5000
Queen Charlotte's Lying-in Hospital	750
Queen Mary's Hospital for the East End (£750 of the grant to new maternity block, in accordance with the scheme submitted to the Fund)	5250
Queen's Hospital for Children	3500
Roll of Honour Hospital for Children	50
Royal Dental Hospital of London	250
Royal Eye Hospital	700
Royal Free Hospital	4250
Royal Hospital, Richmond	550
Royal London Ophthalmic Hospital (£500 of the grant to reduce debt)	3500
Royal National Orthopædic Hospital (£500 of the grant to reduce debt)	2350
Royal Northern Hospital, with which is amalgamated the Royal Chest Hospital, City-road	6800
Royal Waterloo Hospital for Children and Women	2350
Royal Westminster Ophthalmic Hospital	400
St. Andrew's Hospital, Dollis Hill	200
St. Bartholomew's Hospital	8700
St. Columba's Hospital	300
St. George's Hospital	7000
St. John's Hospital, Lewisham	500
St. John's Hospital for Diseases of the Skin	250
St. Luke's Hospital for Advanced Cases (£350 of the grant to acquisition of new premises, and their adaptation in accordance with scheme to be submitted to the Fund)	525
St. Mark's Hospital	200
St. Mary's Hospital (£500 of the grant to improvements to nurses' accommodation and operating theatre, in accordance with the schemes submitted to the Fund)	5500
St. Mary's Hospital for Women and Children, Plaistow	1350
St. Monica's Home Hospital	150
St. Peter's Hospital for Stone	150
St. Saviour's Hospital for Ladies of Limited Means, Osnaburgh-street	150

[1] The Distribution Committee draw attention to the fact that it must not be assumed that the reduction or absence of a grant implies dissatisfaction.

St. Thomas's Hospital (£1000 of the grant to improvements)	£11,000
Samaritan Free Hospital for Women	1650
Santa Claus Home	55
South-Eastern Hospital for Children, Sydenham	325
South London Hospital for Women	1650
Stoke Newington Home Hospital for Women (£250 of the grant to improvements to nurses' accommodation, in accordance with the scheme submitted to the Fund)	300
University College Hospital	6500
Victoria Hospital for Children (£600 of the grant to recent extension of out-patient department and resident medical officers' quarters)	3000
Walthamstow, Wanstead and Leyton Children's and General Hospital	650
West End Hospital for Nervous Diseases (£250 of the grant to improvements to nurses' accommodation)	1200
Western Ophthalmic Hospital	225
West London Hospital	4700
Westminster Hospital (£300 last annual grant to loss on acquisition of new site as agreed, and £1000 to improvement of existing hospital, in accordance with the scheme submitted to the Fund)	6050
Willesden Hospital (£500 of the grant to extension as general hospital, in accordance with scheme to be submitted to the Fund)	1225
Wimbledon Hospital (£250 of the grant to new nurses' home, in accordance with the scheme submitted to the Fund)	425
Winifred House Invalid Children's Convalescent Hospital Home	25
Woolwich and Plumstead Cottage Hospital (see special grant below)	25
	£208,500

Special Grant.—Woolwich and District War Memorial Hospital Building Fund (to provision of general hospital, in accordance with the scheme submitted to the King's Fund) .. £1500

Summary.

Grants	£208,500
Special Grant	£1,500
Total grants to hospitals for the year 1921	£210,000

Mr. WHITTALL having seconded, the motion was carried unanimously.

Report of Convalescent Homes Committee.

Sir WILLIAM H. BENNETT (Chairman of the Convalescent Homes Committee) presented the report, which stated that the sum available for distribution amongst convalescent homes and consumption sanatoria was £10,000, the same amount as in 1920. The number of applications eligible for consideration amounted to 59 from convalescent homes and 10 from consumption sanatoria, as against 51 and 11 respectively last year.

The committee recommended that part of the amount available should be distributed in the form of grants to consumption sanatoria in consideration of the reservation of beds for the use of patients in London hospitals allocated as follows:—

Chest hospitals: 8 beds to the City of London Hospital for Diseases of the Chest; and 4 beds to the Royal Chest Hospital branch of the Royal Northern Hospital.

General hospitals: 2 beds to Charing Cross Hospital; 5 beds to Guy's Hospital; 2 beds to King's College Hospital; 7 beds to the London Hospital; 3 beds to the Middlesex Hospital; 2 beds to the Royal Free Hospital; 2 beds to St. George's Hospital; 1 bed to St. Mary's Hospital; 5 beds to St. Thomas's Hospital; 2 beds to University College Hospital; and 1 bed to Westminster Hospital.

For several years past the committee have recognised that the treatment of tuberculosis has been more and more regarded as coming within the scope of the public health authorities, either directly or as part of the National Insurance Scheme; and the committee have anticipated that a time would come when the Council might no longer feel justified in devoting part of its annual distribution to the provision of accommodation for London patients out of voluntary funds. The greatly increased needs of the London hospitals for maintenance grants have brought this question to a head rather earlier than the committee would have desired, but they feel that they have no option but to recommend that the practice of making grants to consumption sanatoria in consideration of the reservation of beds for patients in London hospitals should be discontinued after the present distribution.

List of Grants Recommended to Consumption Sanatoria and Convalescent Homes.

Sir ALAN ANDERSON (hon. sec.) proposed the list of awards, which were seconded by Sir JAMES KINGSTON FOWLER and carried, as follows:—

Children's Sanatorium, Holt, Norfolk (in consideration of the reservation of 10 children's beds during 1922 for the use of certain London hospitals)	£780
Daneswood Sanatorium, Jewish, Woburn Sands (in consideration of the reservation of two beds during 1922 for the use of certain London hospitals)	270
Devon and Cornwall Sanatorium, Didworthy, South Brent (£1080 of the grant in consideration of the reservation of eight beds during 1922 for the use of certain London hospitals)	1130
Eversfield Chest Hospital, St. Leonards	25
Fairlight Sanatorium, Hastings	25
Kelling Sanatorium, Holt, Norfolk (£540 of the grant in consideration of the reservation of four beds during 1922 for the use of certain London hospitals)	640
Mount Vernon Hospital, Northwood	100
National Association for the Establishment and Maintenance of Sanatoria for Workers, Benenden, Kent (£150 of the grant to mortgage debt and £1620 in consideration of the reservation of 12 beds during 1922 for the use of certain London hospitals)	1870
Northamptonshire Sanatorium, Creaton, Northants (£1080 of the grant in consideration of the reservation of eight beds during 1922 for the use of certain London hospitals)	1130
Royal National Hospital for Consumption, Ventnor	100
All Saints' Convalescent Home, St. Leonards	25
Beau Site Convalescent Home, Hastings	25
Brentwood Convalescent Home for London Children	25
Brooklands Home (Invalid Children's Aid Association), Worthing	25
Bushey and Bushey Heath Children's Convalescent Home	50
Chelsea Hospital for Women, St. Leonards (with a view to encouraging the admission of patients direct from the hospital)	100
Children's Convalescent Home, Beaconsfield	25
Children's Cottage Hospital, Cold Ash, Newbury*	25
Children's Home Hospital, Barnet*	25
City of London Hosp. for Diseases of Chest, Saunderton	50
Clevedon Sanatorium (Invalid Children's Aid Association), Broadstairs	25
Convalescent Home for Poor Children, St. Leonards	150
Convalescent Police Seaside Home, Hove	75
E. G. Anderson Hospital (Home of Recovery), Barnet	200
East London Hospital for Children, Bognor	50
Florence Emma Home (Invalid Children's Aid Association), Dover	25
Friendly Societies' Convalescent Homes, Dover and Herne Bay	50
Great Northern Central Hospital, Clacton	150
Great Northern Central Hospital, Southgate	250
Highgate Convalescent Home for Children, Highgate	50
Jewish Convalescent Home (Children), Brighton	75
King's College Hospital, Hemel Hempstead (the grant is made on condition that patients are admitted direct from the hospital)	120
London and Ascot Priory Convalescent Home, Bracknell	25
London and Brighton Female Convalescent Home, Brighton	25
London Hospital, Reigate	100
Metropolitan Convalescent Institution, Bexhill	25
Metropolitan Convalescent Institution (Children), Broadstairs	100
Metropolitan Convalescent Institution, Walton	100
Middlesex Hospital, Clacton-on-Sea	350
Miller Hospital, Bexhill	100
National Hospital for the Paralysed and Epileptic, East Finchley	125
Paddington Green Children's Hospital, Slough	100
Poplar Hospital, Walton-on-Naze	50
Prince of Wales's Hospital, Nazeing	25
Queen Charlotte's Lying-in Hospital, Kilburn	50
Queen's Hospital for Children, Bexhill	75
Royal Waterloo Hospital* for Children and Women, Whippingham	75
St. Andrew's Convalescent Home, Folkestone	100
St. Andrew's Convalescent Hospital, Clewer	50
St. George's Hospital, Wimbledon	200
St. John's Home, Kemp Town (Brighton)	50
St. Luke's Home (Children), Woodley (Reading)*	25
St. Mary's Convalescent Home, Birchington	50
St. Mary's Home for Children, Broadstairs*	75
St. Michael's Convalescent Home, Westgate	25
St. Peter's Holiday House, St. Leonards	15
Samaritan Free Hospital, Amersham	75
Seaside Convalescent Hospital, Seaford	50
Sunday School Union Convalescent Home, Bournemouth	25
Sunshine Home, Hurstpierpoint	25
Surgical Home for Boys, Banstead*	15
Tilford Convalescent Home for Children, Farnham	15
Victoria Home for Invalid Children, Margate*	15
Victoria Hospital for Children, Broadstairs	200

Summary.

Grants to Consumption Sanatoria	6070
Grants to Convalescent Homes	3930
Total grants for the year 1921	£10,000

* In consideration of convalescent cases.

On the motion of Lady AMPTHILL, seconded by Sir WILLIAM CHURCH, it was resolved that the cheques for the grants should be posted on Monday, Dec. 19th, except in the case of grants for the reservation of beds at consumption sanatoria during 1922, the cheques for which should be posted on Jan. 2nd.

The chairman of the King's Fund Policy Committee (Lord STUART OF WORTLEY), presented a report of that committee on the action taken by the King's Fund as Voluntary Hospitals Committee for London.

Viscount FINLAY then read letters from the King and from the Prince of Wales, expressing their interest in the efforts which were being made to re-establish voluntary hospital finance, and resolutions were passed with the object of re-organising the Fund on a basis better suited to deal with its new tasks. Among the aims of the Fund under the new organisation will be the establishment of a system of contributions from industrial sources and the raising from the general public of the large amount of fresh money which is required on the pound for pound principle to meet the conditions attached to the treasury grants. The following form the President's Powers Committee :—

General Council.—All the present members and the following new members : Col. Mildmay, Sir Cuthbert Wallace, and Major Wernher.

Management Committee.—Lord Stuart of Wortley, Chairman ; Lord Somerleyton, Vice-Chairman ; and the Chairmen of the other committees.

Finance Committee.—Lord Revelstoke, Chairman, Hon. N. Charles Rothschild, Hon. Algernon H. Mills, Sir John Craggs, Mr. Robert Fleming, Mr. M. C. Norman.

Distribution Committee.—Sir Cooper Perry, Chairman, Lord Somerleyton, Sir Francis H. Champneys, Bt., Sir J. Rose Bradford, Sir Cuthbert Wallace, Sir Frederick M. Fry, Sir Frederick Green, Mr. Yvon R. Eccles.

Revenue Committee.—Sir Alan G. Anderson, Chairman, Viscount Burnham, Lord Marshall, Hon. Sir Arthur Stanley, Col. Rt. Hon. Frank Mildmay, M.P., Sir William H. Bennett, Sir William J. Collins, Sir George Lawson Johnston, Sir Edward Penton, Prof. Winifred C. Cullis, Mr. Stuart de la Rue, Major Harold Wernher.

Hospital Economy Committee.—Mr. Leonard L. Cohen, Chairman, Hon. Oswald Partington, Lady Hall, Sir George Makins, Sir Owen Philipps, M.P., Sir James Kingston Fowler, Sir Basil E. Mayhew, Sir Walter Trower, Mr. John G. Griffiths, Dr. H. Morley Fletcher, Mr. Henry L. Hopkinson, Mr. Kenneth Prescott.

Subsequent to the meeting of the King's Hospital Fund a meeting of the League of Mercy was held at St. James's Palace on Dec. 19th, under the presidency of Princess Alice, Countess of Athlone, when it was stated that the actual amount collected by the League during the year was £34,000.

ROUMANIA.

(FROM OUR OWN CORRESPONDENT.)

Sterile Marriages and Examination of Spermal Fluid.

Dr. Achimescu has recently cautioned gynæcologists against the treatment of sterility on the assumption that the condition is always due to the woman. In every case, he believes, the husband should be questioned, and careful examination for spermatozoa should be made several times, at fairly long intervals, between which the subject should abstain from intercourse ; it is well known that a temporary azoöspermia occurs after repeated coitus. Dr. Achimescu has notes of 483 cases of sterility, in 58 of which he found absence of spermatozoa. In 19 of these cases the wives had been under treatment. Furthermore, he found in 37 instances persistent oligospermia, and in 13 instances necrospermia.

Indications for Surgical Sterilisation of Women.

Dr. Panuihescu, surgeon at the Bucharest University clinic, states that the performance of an operation which will render a woman sterile for life is never justifiable except to avoid a dangerous pregnancy, and that a condition that justifies abortion may not justify female castration. A contracted pelvis should not be considered an absolute indication for sterilisation, since with modern technique Cæsarean section has become a comparatively safe operation. Chronic nephritis may be considered an indication ; psychic and nervous conditions are a doubtful indication : insanity may be curable, and if it be severe asylum segregation would render sterilisation needless. In tuberculosis of the lungs abortion should be induced if there is hope for a cure ; in hopeless cases sterilisation is justifiable to avoid the strain of bearing and nursing a child. The most satisfactory method of operation is to remove the entire tube and close the superior angle of the uterus—the procedure advised by Chrobak at Vienna.

Consent to Operation.

Recent legal proceedings involving the question of consent to operation have attracted considerable attention in Roumanian medical and lay papers. One medical writer, in a careful review of the subject, states that the physician finds that he must in all cases either keep within the strict scope of the authority expressly given to him, or must so safeguard himself that he can prove by the testimony of reliable witnesses that he was asked to perform what operation he might find necessary, and that the operation actually performed was, in fact, necessary or desirable. There is some confusion as to the person from whom consent must be obtained ; it is, however, laid down as a general rule that this person is the husband in the case of an operation upon the wife, whilst for operations on children consent must be obtained from the parents, guardians, or other persons legally responsible for the care of the child.

Diarrhœa in Albania.

There is an alarming increase of gastro-intestinal disorders in Albania ; thousands of working men are unemployed, and are compelled to live on a semi-starvation diet. The sanitary conditions of the bakeries are very unsatisfactory ; the bread is bitter and made of inferior flour (maize) in a primitive manner. Another great source of gastro-intestinal disease is the enormous consumption of decayed vegetables, raw or in a half-cooked condition.

Measles Epidemic in Bessarabia.

Since the outbreak of measles three weeks ago the disease has spread rapidly ; its dissemination is held by health officials to be due to negligence on the part of parents in not calling in a physician to see that the affected children are properly isolated. The epidemic is most severe in the Kishinev district ; in that city all school-houses have been disinfected, and in addition the Bureau of Public Sanitation has disinfected the homes of many children. Last week 156 cases were reported to the district medical officer. The cases are all very mild, and recovery takes place almost without complication ; no fatal case has yet been reported.

"Club Rates" for Medical Services.

In a large town, Figulmares, a private sick club has attempted to exploit the medical men by underpaying them and by admitting members without regard to their financial status, so that wealthy families, who could easily pay regular medical fees, availed themselves of this form of cheap medical service. The local medical union has adopted a resolution to the effect that on and after Jan. 1st, 1922, no member of the union shall accept a post under the sick club, or continue to work at a rate less than the regular charges for services to patients not members of that club ; also that no physician shall attend families of the members of this club at a fee lower than the regular rate. Nothing in this resolution is to be construed as preventing any member from attending the worthy poor at a less rate, or giving free service to those who are too poor to pay anything. Any violation of this order will be considered unprofessional conduct, and it will be the duty of the censors to expel such members from the union, if proof of such conduct be presented to them.

Bucharest, Dec. 1st.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

BIRKENHEAD.

ESTIMATED population for the year 1920, 153,951; birth-rate, 27·4; death-rate, 13·2; infant mortality rate, 102; death-rate from pulmonary tuberculosis, 0·76; and from other forms of tuberculosis, 0·37. Dr. D. Morley Mathieson gives a valuable table showing separately the death-rates from tuberculosis among males, females, and children under 5, for 10 years back. Such an analysis reveals the nature of the local problem, and should be given in every annual health report. As is usual in the case of seaports, where there is shipbuilding and much outdoor male occupation, the male death-rate is not much higher than the female. Dr. Mathieson tells us that the Birkenhead Corporation have agreed to use the county farm-colony at Wrenbury Hall, and that conferences have been held with neighbouring towns with a view to utilising more extensively the Leasowe Hospital for surgical tuberculosis. Out of 32 cases of ophthalmia neonatorum notified, one child lost an eye, and it has now been decided to supply practising midwives with a non-toxic preparation of silver nitrate. The provision of a municipal maternity hospital is under consideration. In his school report Dr. Mathieson states that a dental clinic has been established, and that a cleansing station, an open-air school, and X ray treatment for ringworm are needed. An interesting statement is given showing the results of inspection and treatment at the girls' secondary school. The percentage of defects found at the primary inspection in January, 74·5, was reduced to 14·5 at the third re-inspection in December.

RICHMOND (SURREY).

Estimated population for 1920, 35,572; birth-rate, 20·7; death-rate, 11·4; infant mortality rate, 57; tuberculosis death-rate, 0·9. Dr. C. W. Hutt (who has since become M.O.H. for Holborn) mentions that, in consequence of a letter from the President of the British Red Cross Society and the Order of St. John, arrangements have been made for the local voluntary aid detachment to take part in the maternity and child welfare scheme, adding that the experiment has been a marked success. The water-supply of Richmond is in part obtained from Petersham Well, which, since 1919, has been purified by chlorination. Pure chlorine gas is used, and is administered and measured by a Wallace-Tiernan plant. It is found with this water that a dose of chlorine as small as 1 part in 4,000,000 to 5,000,000 causes a degree of purification adequate for all practical purposes and superior to that obtained by open sand-filters. Dr. Hutt, in referring to a large camp which was held in the Old Deer Park last summer, recommends that in future the sanction of the Corporation for such camps be only given on condition that sanitary accommodation is provided.

WORCESTER.

Estimated population for 1920, 49,248; birth-rate, 23·2; death-rate, 13·01; tuberculosis death-rate, 1·06; infant mortality rate, 67. Dr. Mabyn Read says the efficiency of the public health service has been greatly increased by the appointment of Dr. Mary R. Mitchell to develop the maternity and child welfare work and to act as assistant tuberculosis officer, adding that Worcester stands sixth from best among the county boroughs for infant mortality rate. The fact that 37 of the 77 infant deaths occurred in the first month of life is evidence of the need for antenatal work. The local authority paid £31 13*s.* in fees to midwives for attendance on necessitous cases, and also spent £65 19*s.* on providing home-helps for 55 cases. £175 was spent on dental treatment for expectant and nursing mothers, £47 of which amount was received from the patients. Cases of ophthalmia neonatorum are treated at the ophthalmic hospital for one guinea per case, and collosol argentum has been supplied to midwives since October. The antenatal clinic is making good progress, and Dr. Read thinks the £185 spent on dinners for necessitous expectant and nursing mothers has been of great benefit in enabling the mothers to suckle their babies. Dr. Read expresses his gratitude to the voluntary workers who have helped to make the child welfare clinics successful, and mentions that new premises for the work are badly needed. The general housing conditions in the city, he states in conclusion, have not greatly improved during 1920. As only 16 new houses have been completed and there have been 500 more births than deaths, we should imagine they have become worse.

VITAL STATISTICS OF LONDON DURING NOVEMBER, 1921.

IN the accompanying table will be found summarised statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. The enumerated population (unrevised) of the last census has been used for calculating the rates in the table, with a deduction of the non-civilian population in the City of Westminster and in the borough of Woolwich. With regard to the notified cases of infectious disease it appears that the number of persons reported to be suffering from one or other of the ten diseases notified in the table was equal to an annual rate of 17·0 per 1000 of the population, enumerated at 4,476,238 persons; in the three preceding months the rates had been 8·6, 14·1, and 19·5. Among the metropolitan boroughs the lowest rates from these diseases were recorded in Kensington, Chelsea, the City of Westminster, St. Marylebone, the City of London, and Bethnal Green; and the highest in Hammersmith, St. Pancras, Islington, Bermondsey, Battersea, Greenwich, and Woolwich. The prevalence of enteric fever was about equal to that in the preceding month; of the 38 cases notified during the five weeks ended Dec. 3rd, 7 belonged to Kensington, 4 to Wandsworth, and 3 each to Paddington, Chelsea, St. Pancras, Southwark, and Greenwich. There were 20 cases of enteric fever under treatment in the Metropolitan Asylums Hospitals at the end of the month, against 32, 37, and 28 at the end of the three preceding months; the weekly admissions averaged 4, against 5, 7, and 4 in the three preceding months. The prevalence of scarlet fever showed a decline of 18 per cent. from the preceding month, but was higher than in any other month of the present year or the preceding three years; this disease was proportionally most prevalent in Hammersmith, St. Pancras, Islington, Battersea, Deptford, Greenwich, and Woolwich. The Metropolitan Asylums Hospitals contained 5879 scarlet fever patients at the end of the month, against 3408, 4847, and 6154 at the end of the three preceding months; the weekly admissions averaged 802, against 467, 840, and 1000 in the three preceding months. Diphtheria showed a very slight fall in prevalence—about 1½ per cent.—from the preceding month, but was still higher than in any other month of the present year or the three preceding years; the greatest proportional prevalence of this disease occurred in Hampstead, Stepney, Bermondsey, Battersea, Greenwich, and Woolwich. The number of diphtheria patients under treatment in the metropolitan hospitals, which had been 1709, 2031, and 2777 at the end of the three preceding months, further rose to 3055 at the end of November; the weekly admissions averaged 416, against 209, 322, and 445 at the end of the three preceding months. Erysipelas was proportionally most prevalent in Finsbury, the City of London, Shoreditch, Bethnal Green, Poplar, Southwark, and Greenwich. The three cases of poliomyelitis belonged respectively to St. Pancras, Battersea, and Wandsworth; in the three preceding months the notified cases numbered 13, 10, and 5. Twelve cases of encephalitis lethargica were notified during November, against 5, 5, and 3 in the three preceding months; of these, 3 belonged to Southwark, 2 to Chelsea, and 2 to Lambeth. The notified cases of cerebro-spinal fever numbered 6, against 9, 5, and 3 in the three preceding months. The 34 cases of puerperal fever included 5 in Southwark, 4 in Stepney, and 3 in Paddington.

The mortality statistics in the table relate to the deaths of civilians actually belonging to the several boroughs, the deaths occurring in institutions having been distributed among the boroughs in which the deceased persons had previously resided. During the five weeks ended Dec. 3rd, the deaths of 6450 London residents were registered, equal to an annual rate of 15·0 per 1000; in the three preceding months the rates had been 10·8, 11·0, and 11·4 per 1000. The death-rates ranged from 11·9 in Lewisham, 12·4 in

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING NOVEMBER, 1921.

(Specially compiled for THE LANCET.)

CITIES AND BOROUGHS.	Enumerated population, 1921 (unrevised).	Notified Cases of Infectious Disease.												Deaths from Principal Infectious Diseases.								Deaths from all causes.	Death-rate per 1000 living.
		Enteric fever.	Other continued fevers.	Small-pox.	Scarlet fever.	Diphtheria.*	Erysipelas.	Poliomyelitis and polioencephalitis.	Encephalitis lethargica.	Cerebro-spinal fever.	Puerperal fever.	Total.	Annual rate per 1000 persons living.	Enteric fever.	Small-pox.	Measles.	Scarlet fever.	Whooping-cough.	Diphtheria.*	Diarrhœa and enteritis (under 2 years).	Total.	Annual rate per 1000 persons living.		
LONDON	4,476,238	38	—	—	4730	2221	272	3	12	6	34	7316	17·0	9	—	43	35	40	165	135	427	1·0	6450	15·0
West:																								
Paddington ...	144,273	3	—	—	116	76	10	—	—	1	3	209	15·1	1	—	—	1	1	8	6	17	1·2	196	14·2
Kensington... ...	175,686	7	—	—	114	37	7	—	—	—	—	165	9·8	2	—	—	—	—	—	8	10	0·6	297	17·6
Hammersmith...	130,287	—	—	—	182	72	8	—	—	—	—	262	21·0	1	—	—	3	—	—	2	6	0·5	181	14·5
Fulham	157,944	1	—	—	147	87	7	—	—	—	—	242	16·0	—	—	1	4	1	5	3	14	0·9	216	14·3
Chelsea	63,700	3	—	—	40	13	2	—	2	—	1	61	10·0	—	—	—	—	—	2	1	3	0·5	105	17·2
City of Westmin'r	138,402	—	—	—	104	26	1	—	1	—	1	133	10·0	—	—	—	2	—	—	1	3	0·2	187	14·1
North:																								
St. Marylebone...	104,222	1	—	—	72	32	4	—	—	—	—	109	10·9	—	—	—	1	—	3	6	10	1·0	152	15·3
Hampstead ...	86,080	1	—	—	50	90	4	—	—	—	—	145	17·6	—	—	—	—	1	7	1	9	1·1	107	13·0
St. Pancras... ...	210,986	3	—	—	287	124	14	1	1	—	2	432	21·4	—	—	9	1	1	9	5	25	1·2	332	16·4
Islington	330,028	2	—	—	450	186	15	—	—	1	—	654	20·7	—	—	1	2	1	11	15	30	0·9	517	16·3
Stoke Newington	52,167	—	—	—	56	31	1	—	—	—	—	88	17·6	—	—	—	—	—	4	1	5	1·0	73	14·6
Hackney	222,159	1	—	—	228	83	10	—	—	—	2	324	15·2	—	—	—	2	1	2	10	15	0·7	318	14·9
Central:																								
Holborn	42,796	—	—	—	36	18	2	—	—	—	1	57	13·9	—	—	—	—	—	—	2	2	0·5	72	17·5
Finsbury	76,019	—	—	—	71	43	12	—	—	—	—	126	17·3	—	—	—	1	—	4	3	8	1·1	140	19·2
City of London...	13,706	—	—	—	11	2	2	—	—	—	—	15	11·4	—	—	—	—	—	—	—	—	—	21	16·0
East:																								
Shoreditch... ...	104,308	—	—	—	92	59	10	—	1	—	1	163	16·3	1	—	—	—	1	4	7	13	1·3	189	18·9
Bethnal Green...	117,238	—	—	—	87	46	12	—	1	—	2	148	13·2	—	—	2	—	1	4	8	15	1·3	174	15·5
Stepney	249,738	1	—	—	127	189	17	—	—	—	4	338	14·1	—	—	4	—	3	23	9	39	1·6	400	16·7
Poplar	162,618	—	—	—	170	73	16	—	—	—	1	260	16·7	—	—	14	2	5	9	2	32	2·1	256	16·4
South:																								
Southwark... ...	184,388	3	—	—	168	73	20	—	3	1	5	273	15·4	—	—	3	3	1	2	4	13	0·7	281	15·9
Bermondsey ...	119,455	1	—	—	102	131	5	—	—	—	—	239	20·9	—	—	1	1	4	8	8	22	1·9	197	17·2
Lambeth	302,960	—	—	—	319	85	22	—	2	—	2	430	14·8	—	—	5	3	5	7	8	28	1·0	413	14·2
Battersea	167,693	1	—	—	286	112	9	1	—	—	2	411	25·6	—	—	—	1	4	8	4	17	1·1	200	12·4
Wandsworth ...	328,656	4	—	—	325	91	13	1	1	—	2	437	13·9	—	—	1	3	2	5	4	15	0·5	406	12·9
Camberwell ...	267,235	2	—	—	300	110	15	—	—	1	2	430	16·8	3	—	—	1	3	9	3	19	0·7	334	13·0
Deptford	112,500	—	—	—	168	33	5	—	—	—	—	206	19·1	—	—	—	—	1	1	—	2	0·2	150	13·9
Greenwich... ...	100,493	3	—	—	199	116	12	—	—	—	1	331	34·4	—	—	1	—	1	9	7	18	1·9	144	14·9
Lewisham	174,194	1	—	—	229	81	8	—	—	1	—	320	19·2	1	—	—	3	1	4	2	11	0·7	198	11·9
Woolwich	136,307	—	—	—	194	102	9	—	—	1	2	308	23·6	—	—	1	1	2	17	5	26	2·0	194	14·8

* Including membranous croup.

Battersea, 12·9 in Wandsworth, and 13·0 in Hampstead and in Camberwell, to 17·2 in Chelsea and in Bermondsey, 17·5 in Holborn, 17·6 in Kensington, 18·9 in Shoreditch, and 19·2 in Finsbury. The 6450 deaths from all causes included 427 which were referred to the principal infectious diseases; of these, 9 deaths resulted from enteric fever, 43 from measles, 35 from scarlet fever, 40 from whooping-cough, 165 from diphtheria, and 135 from diarrhœa and enteritis among children under 2 years of age. No death from any of these diseases was recorded in the City of London. Among the metropolitan boroughs the lowest death-rates from these diseases were recorded in Hammersmith, Chelsea, the City of Westminster, Holborn, Wandsworth, and Deptford; and the highest in Stepney, Poplar, Bermondsey, Greenwich, and Woolwich. The 9 fatal cases of enteric fever exceeded the average in the corresponding period of the five preceding years by 3; of these, 3 belonged to Camberwell and 2 to Kensington. The 43 deaths from measles were 22 fewer than the average; of these, 14 belonged to Poplar, 9 to St. Pancras, 5 to Lambeth, 4 to Stepney, and 3 to Southwark. The 35 fatal cases of scarlet fever were 20 in excess of the average; of these, 4 belonged to Fulham, and 3 to each of the boroughs of Hammersmith, Southwark, Lambeth, Wandsworth, and Lewisham. The 40 deaths from whooping-cough were 14 greater than the average; of these, 5 belonged to Poplar, 5 to Lambeth, 4 to Bermondsey, 4 to Battersea, 3 to Stepney, and 3 to Camberwell. The 165 fatal cases of diphtheria exceeded the average by 78; this disease was proportionally most fatal in Hampstead, Stoke Newington, Stepney, Greenwich, and Woolwich. The 135 deaths from infantile diarrhœa were 16 in excess of the average; the greatest proportional mortality from this disease occurred in St. Marylebone, Shoreditch, Bethnal Green, Bermondsey, and Greenwich. The aggregate mortality in London during November from these principal infectious diseases was 34 per cent. above the average.

The deaths from influenza registered in London during the five weeks ended Dec. 3rd numbered 91, against 9, 21, and 40 in the three preceding months, and 90, 34, 8676, 97, and 67 in the corresponding periods of the five preceding years.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surgn. Lieut. C. M. Williams has been promoted to the rank of Surgn. Lt.-Comdr.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. and Bt.-Col. M. H. G. Fell, C.B., C.M.G., is restored to the establishment.

Capt. E. G. S. Cane, D.S.O., relinquishes the temp. rank of Maj.

Temp. Capt. S. P. Snook relinquishes his commn. and retains the rank of Capt.

Temp. Capt. E. C. A. Smith relinquishes his commn. on appt. to the Ind. Med. Service.

TERRITORIAL ARMY.

Lt.-Col. (Bt. Col.) J. R. Kaye, having attained the age limit, is retired and retains his rank.

The undermentioned officers, having attained the age limit, are retired and retain their rank except where otherwise stated: Lt.-Cols. E. M. Callender and J. Allison (with permission to wear their prescribed uniform), and P. C. Smith. Majs. A. MacGillivray, J. Wilson, and W. W. Jones (with permission to wear their prescribed uniform), and A. Robertson. Capts. A. Baxter (granted the rank of Lt.-Col.), A. N. S. Carmichael, J. Wood, D. G. Kennard, and A. E. Ridsdale (granted the rank of Maj.), and R. A. Burditt, H. A. Beetham, H. W. Lance, J. S. Clarke, and F. G. Vicars.

Maj. R. C. Highet (Lt.-Col., ret., T.F.) reverts to the retired list and retains his rank, with permission to wear the prescribed uniform.

Officers relinquishing their commissions and retaining their ranks: Capts. P. H. G. Gosse, C. G. Brentnall, A. L. Bodley, J. Graham (granted the rank of Maj.), J. W. M. Jamieson, A. W. Sutherland.

1st Lond. (C. of L.) San. Co.: Lt. E. V. Suckling relinquishes his commission and retains his rank.

4th N. Genl. Hosp.: Maj. D. J. G. Watkins, having attained the age limit, is retired and retains the rank of Maj.

TERRITORIAL ARMY RESERVE.

Maj. A. Greenwood, from Genl. List, R.A.M.C., to be Lt.-Col.

ROYAL AIR FORCE.

Group Capt. David Munro to be Air Commodore.

INDIA AND THE INDIAN MEDICAL SERVICE.

Surg.-Commodore C. W. A. Newport, R.N., is accompanying the Prince of Wales on his tour through India, and Lieut.-Col. F. O'Kinealy, Bengal, has been appointed Chief Medical Officer to His Royal Highness. Maj.-Gen. W. H. B. Robinson, C.S.I. has been appointed President of the Governing Body of the Bengal State Medical Faculty, vice Lieut.-Col. F. O'Kinealy, C.I.E., resigned; and Lieut.-Col. D. C. Kemp Civil Surgeon, Cochin, on return from leave. Maj. K. Cantlie has been granted one year's leave. On transfer from Lahore Lieut.-Col. J. G. G. Swan, C.I.E., has resumed charge as Civil Surgeon, Ferozepore. Maj. D. H. Rai, M.C., has assumed charge of the Civil Surgeon, Ludhiana. Maj. R. B. Seymour Sewell, surgeon naturalist, Marine Survey, has been granted one and a half years' combined leave. On return from military duty Lieut.-Col. A. M. Fleming has been posted to Asugor as Civil Surgeon to the executive and medical charge of the Saugor District Jail. Capt. A. F. W. da Costa, officiating civil surgeon, has reverted to his substantive appointment of Assistant Surgeon and been posted to the main hospital, Asugor. Maj. W. W. Jeudwine has handed over charge of the duties of Superintendent of the District Jail at Rawalpindi to Lieut.-Col. P. St. C. Moore. Maj. C. A. Godson has taken over charge as Police Surgeon, Calcutta, during the deputation of Lieut.-Col. N. P. Sinha to Simla; and Maj. M. S. Irari has been posted to Bombay.

Obituary.

JOHN HARLEY, M.D., F.R.C.P.LOND.,

CONSULTING PHYSICIAN TO ST. THOMAS'S HOSPITAL AND TO THE LONDON FEVER HOSPITAL.

WE regret to announce the death of Dr. John Harley, which occurred at Pulborough, Sussex, on Dec. 9th. As a physician and as a teaching member of the staffs of two great general hospitals in London, he was a familiar feature in medical circles for 30 years.

John Harley was born in 1833, being at the time of his death in his eighty-ninth year. He received his medical education at King's College Hospital, where he entered as a senior scholar and where he later became a fellow. He graduated in medicine at the University of London in 1860, and took the M.R.C.P. Lond. in the same year. After holding the junior appointments at the hospital he was appointed assistant physician, a post which he held for eight years, and where his popularity among his pupils was marked upon his leaving them by a spontaneous presentation. In 1872 he was appointed assistant physician at St. Thomas's Hospital, having in the meantime been elected F.R.C.P. His connexion with the Royal College of Physicians of London was always a close one. He was Goulstonian lecturer in 1869 and an examiner at the College for three separate periods between 1875 and 1886, and in 1889 he delivered the Lumleian lectures. He took as his subject enteric fever, and these lectures, which were published in abstract in THE LANCET, created considerable sensation. They were fluent and attractive, but they were also directed against modes of thought which were commonly accepted concerning a common disease. Harley had the courage to utter heretical views, and not for the first time, as he had already adopted a singular attitude concerning the relationship between scarlet and enteric fevers, believing both to have a common origin in catarrh. The intention of the Lumleian lectures on enteric fever was to lay stress on the influence of exposure to cold, and to subvert the doctrine of contagiousness, if not that of the specificity of typhoid fever, itself. Undoubtedly his line of thought was cleverly maintained, and undoubtedly also it is a good thing that orthodox beliefs should now and again be challenged and their too servile acceptance be prevented, but Harley made no converts, for his pathological foundations were seen to be unsound. He was elected on the Council of the Royal College of Physicians in 1890, and in 1893 was appointed consultant physician to St. Thomas's Hospital.

Dr. John Harley never attained to the professional position which his wide attainments, energy, and sympathetic nature seemed to fit him for, and the reason for this is indicated in what we have already said and is substantiated by the following note which we have received from one of his distinguished colleagues.

S. J. S. writes:—

John Harley came to St. Thomas's Hospital with a distinguished record from King's College, and later his appointments and writings added to that record. He was a man of ability who displayed a keen interest in medicine and in many other subjects. He had a suave and attractive manner, formed independent opinions, and expressed them with confidence. How, then, it may be asked, was it that he failed to earn greater distinction in his profession? The probable answer is that he so exaggerated and distorted the good points in his character that so far from forwarding his interests they became obstacles to success. Take, for instance, his genial manner. He would meet everyone with a smile, a half bow, and a prolonged and vigorous handshake; but the whole thing was so overdone that it became a standing joke. One student would make a bet with another that he would shake hands with Harley so many times before he got from the central hall to his ward, and by running up staircases and appearing suddenly round corners he would probably win his bet. Indeed, this universal hand-shake sometimes gave rise to ludicrous scenes. On one occasion one of the resident staff hurried up to Dr. Harley's ward to see a case he had just admitted, and arriving in the ward about five minutes before Harley was due he was surprised to see the "Sister" standing pensively in front of the fire-place, facing the door, with an inkstand in one hand and blotting paper in the other. On being asked what this meant, she replied that it was to avoid the handshake.

The opinions which Harley formed on different events and different scientific subjects were often quite out of keeping with modern knowledge, and ignored modern methods of investigation; but once having stated them nothing could move him to reconsider them. He apparently never dreamt of the possibility of his being wrong. The result was that no one took Harley seriously, and he lost the influence and respect he might otherwise have gained. There is no doubt that he was a man of ability, but he failed to turn it to good account.

From the same source, and from others of Harley's colleagues, we have received tributes to his goodness and generosity, showing that his genial manner was no assumption but covered great kindness of heart. He would constantly assist his poorer hospital patients from his purse, and befriend his old students in times of need. He was a man of considerable all-round accomplishment rather than a great physician.

GREGORY PAUL JORDAN, M.B., C.M. EDIN., LL.D. HONG-KONG.

Dr. G. P. Jordan, who died in London on Dec. 4th at the age of 64 years, was port health officer at Hong-Kong and professor of tropical medicine in the University, where he was for a time acting Vice-Chancellor. Graduating in medicine at the University of Edinburgh in 1880, he studied at St. Thomas's Hospital, London, Cambridge, Vienna, and Paris, taking the M.R.C.S. Eng. in 1884. He went out to Hong-Kong as colonial surgeon, on the abolition of that post became port health officer, and with Manson and Cantlie helped to found what is now known as the old Medical College. He was on the staff of the Alice Memorial Hospital and during the war took on the surgical superintendence of police. Devotion to work was already impairing his health when he accepted the onerous position of acting Vice-Chancellor of the University on Sir Charles Eliot's departure for Japan, but he had the satisfaction of knowing that his brief stewardship left the institution in a sounder financial position. His services were recognised by the bestowal of an honorary LL.D. degree. A Freemason, a noted amateur photographer, and a keen sportsman, Jordan was a popular figure in Hong-Kong, where his presence will be missed by all classes.

Correspondence.

"Audi alteram partem."

THE ÆTIOLOGY OF ADENOIDS.

To the Editor of THE LANCET.

SIR,—In his book on Adenoids Dr. Macleod Yearsley says that "adenoids are most prevalent in damp, cold countries," and to emphasise the fact puts this quotation in italics. Similarly, such an authority as Sir StClair Thomson says "there can be no doubt that adenoids are very much more frequent in temperate, cold, damp climates like our own." With the statistics and observations which have led laryngologists to this conclusion I need not deal. My observations simply correspond with them on this point. My special plea with regard to climate and adenoids was merely that we should not deliberately impose a cold and damp atmosphere on children, by making them sleep in bedrooms with the windows kept open in cold and damp weather. If we do, and then send them to the warm, germ-laden atmosphere of the schoolroom, we are only asking for trouble. To protect children from adverse climatic influences at night, and send them to something like open-air schools by day, would be acting more in accord with instinct, reason, and the dictates of evolution. Dr. Harry Campbell seems to admit that "damp predisposes to catarrh," but he says, "The climate of our country has been damp for thousands of years, but we have the evidence derived from disinterred skulls that it is only within comparatively recent years that adenoid disease has been common in this country." In this, again, I quite agree with him. Children were consistently protected from adverse climatic conditions, especially at night, until the end of last century and the beginning of this, and the great prevalence of adenoids appears to synchronise exactly with the deliberate abandonment of this precaution. Instead of the three cases recorded by Mr. W. Rushton being exceptional, they but illustrate what was going on all over the country. "The peculiar nature of the British diet" does not seem to account for the facts. Take, for example, the statistics of Gradenigo and Massei in Italy. Gradenigo, in his clinic at Turin (a subalpine climate), found on the average one case in three, while Massei, in Naples (a warm and genial climate), found only five cases in 15 years.—I am, Sir, yours faithfully,

Harley-street, W., Dec. 10th, 1921. J. SIM WALLACE.

To the Editor of THE LANCET.

SIR,—I note that Dr. Harry Campbell, whilst ascribing the frequency of adenoids to faulty gastric and intestinal digestion, the result of insufficiently masticated starchy food, admits that the food factor is not the only one in the causation of the disease. My contention is that if food plays any part at all in the ætiology of the disease it is a very slight one indeed and only of secondary nature. Dr. Campbell admits I am right in attributing to oft-repeated colds much of the active causation of adenoids, but when he seeks to attribute these colds to the status catarrhalis I think he is confusing cause with effect.

Against Dr. Campbell's dietetic theory I would like to advance the following:—

1. Adenoids are not peculiar to the British race. They are common in wet and damp localities—e.g., in the north of Italy. Meyer showed the Hebrew race to be especially affected. They occur in the Arctic circle amongst the Esquimaux and in the Malays on the Equator. They constitute no new disease. Meyer and Semon drew attention to the busts of antiquity and pictures of the Renaissance where the "adenoid facies" is frequently seen. And Hippocrates clearly referred to the condition.

2. Like Dr. Stewart Low, I have operated for the removal of adenoids on a large number of breast-fed children. In those cases attended by mouth-breathing it has only been necessary for the patient to wear a chin-strap at night for a fortnight and, if old enough, to carry out daily a graduated exercise for the catarrh to disappear, the tendency to catch cold to be markedly reduced, and for natural nasal breathing to replace the bad habit. It is true that gastric and intestinal catarrh is common in children the subjects of adenoids, but I am strongly of opinion that this is due in the main to direct extension from the naso-pharynx, and, to a lesser degree, to the swallowing of infected mucus. I have repeatedly come across cases of catarrhal jaundice in children with adenoids. And after removing the adenoid vegetations I have not known the jaundice to return.

3. The striking improvement in the general health which follows the curetting of the affected lymphatic surfaces in children with adenoids is also noticeable after local non-operative treatment to the nose and throat. With reference to unhealthy tonsils, I can fully endorse the experience of Mr. F. Stoker, as recounted in this month's issue of the *Practitioner*, with respect to infected tonsils. It is almost an every-day occurrence in my practice to note the great benefit a patient derives from the forcible evacuation of tonsillar crypts by pressure.

The cause of adenoids is repeated cold-catching and the acquirement in youth of immunity from the exanthemata. Why colds are of such frequent occurrence is a subject which largely concerns the skin and the subcutaneous vaso-motor reflexes, not digestion.—I am, Sir, yours faithfully,

HARRY MERRALL.

St. Anne's-on-the-Sea, Dec. 13th, 1921.

SOME HEART PROBLEMS.

To the Editor of THE LANCET.

SIR,—In his address upon this subject, appearing in your issue of Dec. 10th, Prof. E. H. Starling refers to the importance of the "limits set by the indistensible pericardium." I conclude from this that Prof. Starling considers one function of the pericardium to be that of a guardian of the heart, a protector against over-dilatation.

It does not seem to me that the pericardium possesses this power in the human subject. I have not the details of a few observations made in the post-mortem room at hand, but several years ago, after tying all the vessels leaving or entering the heart, outside the unopened pericardium, a glass tube was passed through the vena cava and another through a pulmonary vein, by means of which all the cavities of the heart were distended with water at a pressure of a column of about 3 feet in height. After thus filling all the cavities of the heart, it was ascertained how much water could still be held between the distended heart and the pericardium. With one exception there was sufficient room for the pericardium to hold water, although all four cavities of the heart were distended to their full extent. And it must be remembered that in life all four cavities of the heart could not be fully distended at the same time. The pericardium could only exert the power of restraining dilatation of the heart if it were to fit the ventricles closely in diastole, while the auricles were in systole. These observations were made on cases in which death had occurred from various diseases, such as typhoid fever, pneumonia, and also of some cases of cardiac disease.

The theory was once advanced that the remarkably rapid enlargement of the heart, which not uncommonly occurs in rheumatic pericarditis, could be explained by softening of the inflamed pericardium allowing dilatation of the heart. There are, however, two reasons why this theory cannot be accepted. In the first place, in more severe non-rheumatic forms of pericarditis—e.g., suppurative—there need be no dilatation of the heart. That is to say, the more severe forms of inflammation of the pericardium do not lead to softening of the pericardium, allowing dilatation of the heart. In the second place, the rapid enlargement

of the heart occurring in rheumatic pericarditis is not simply dilatation, it is a form of hypertrophy. In some way, possibly by interference with the metabolism, the heart may double or even treble its weight in about a week, showing that the enlargement is due to some peculiar effect of the rheumatic toxin, and is not a mere mechanical result of inflammation of the pericardium.

The above-mentioned sample experiments would lead me to believe that the normal pericardium is far too capacious to exert any restraining influence on the heart; and some cases of death from rheumatic pericarditis, seen in the post-mortem room, would indicate that there may be room within the cavity of the pericardium for the heart quickly to increase to three times its usual size.

I am, Sir, yours faithfully,

Norwich, Dec. 17th, 1921. THEODORE FISHER.

THE ORGANISATION OF MEDICAL EDUCATION.

To the Editor of THE LANCET.

SIR,—May I be allowed to support the general principle enunciated by Sir Clifford Allbutt and "C. L." in your columns last week? I found my claims to do so on the fact that I am an ophthalmic surgeon who has had experience of general practice; and further, that I am interested in psychology.

The inefficiency of the present curriculum is vividly exemplified by the inability of many general practitioners to cope with serious ophthalmic conditions, such as ophthalmia neonatorum. It is a deplorable fact that many babies are allowed to become blind through ophthalmia neonatorum in spite of the fact that the mother and child have been under the care of a doctor. The Council of British Ophthalmologists has urged the General Medical Council to insist upon examination in ophthalmology of candidates for the qualifying diplomas. Owing to the overcrowded curriculum students will not, indeed cannot, devote sufficient attention to a subject which they can neglect with impunity so far as the qualifying examination is concerned. The Council of British Ophthalmologists has been rebuffed by the General Medical Council, but it is encouraging for them to learn from your columns (THE LANCET, Dec. 10th, p. 1238) that the Examination Committee of the General Medical Council has passed a resolution supporting in every respect the recommendations of the ophthalmologists.

Yet the carrying out of these recommendations will add another straw to the camel's burden—and it is by no means the only straw. Oto-rhino-laryngology and psychology also demand consideration. With regard to the latter subject, I should like to support "C. L.'s" remarks. The student devotes many years to the study of the human body, yet receives little or no instruction in the working of the human mind. A large proportion of the general practitioner's work is the treatment of nervous disorders which manifest themselves as mental abnormalities. He has to cope with them empirically, unaided by any knowledge of the underlying scientific principles. It cannot be doubted that the course of instruction in physiology should be followed by one on the principles of psychology, and that psycho-pathology should form an integral part of the course in medicine.

Everyone will agree that the present curriculum is overcrowded. The impossible is attempted—viz., that of turning out general practitioners and hospital physicians and surgeons from the same mill. Seeing that the majority of students will become general practitioners, and that all medical men should be equipped with the knowledge which is most necessary for general practitioners, it would appear obvious that the qualifying curriculum and examinations should be designed specially for the requirements of this preponderant class. In other words, it should have a definitely utilitarian aim. Much of the smatterings of scientific knowledge now regarded as essential should be eliminated, leaving room for matters of greater practical importance.

It will be objected that this view is subversive of scientific education. In my opinion, however, the non-utility, "pure" science theory of education has been exaggerated to the detriment of scientific education, and can be shown to be unsound on biological and psychological grounds. I contend that it is not only possible to teach the scientific method while devoting special attention to utilitarian aims, but that for the majority of people it is the only way.

It is becoming increasingly evident that the medical curriculum must be revised, and it is a fortunate occurrence that so distinguished a leader of British medicine as Sir Clifford Allbutt has given such an admirable lead to the movement.

I am, Sir, yours faithfully,

J. HERBERT PARSONS.

Queen Anne-street, Cavendish-square, W., Dec. 17th, 1921.

TREATMENT OF SCARLET FEVER WITH HUMAN IMMUNE SERUM.

To the Editor of THE LANCET.

SIR,—The annotation in your issue of Dec. 3rd on the treatment of scarlet fever with immune human serum, and your remark therein that this form of treatment "has not to our knowledge been employed in this country," leads me to forward the chart and these notes of a patient who was most successfully treated by this method in October, 1915, in the City of Glasgow Fever Hospital, Belvidere, where the method had been tried in a fair number of cases by Dr. Thomas Archibald, medical superintendent.

The patient, A. N., a probationer nurse, aged 18 years, sickened on Oct. 4th, 1915, a scarlatinal rash appearing on the following day, when she was admitted to a scarlet fever ward under my care. Her condition from the first was one of extreme gravity, the disease rapidly assuming the features of the sub-malignant type. On Oct. 6th 25 c.cm. of polyvalent antistreptococcal serum (Parke Davis & Co.) were administered subcutaneously. On Oct. 7th 25 c.cm. of antistreptococcal (scarlatinæ) serum (P. D. & Co.) were injected intramuscularly. Her condition then was one of

Scarlatinal rash appeared at R. Antistreptococcal serum was given at *a* and *b*. Convalescent human serum at *c* and *d*. Serum rash appeared at S.R. and faded at S.R.F. At P.D. profuse desquamation set in.

intermittent rambling delirium, the rash being generalised and livid. On that night (7th) Dr. Archibald suggested the employment of a human serum. Blood was obtained from Nurse A., a patient in the ward, who was in her fifth week of convalescence from a sharp uncomplicated attack of scarlatina. On the afternoon of the 8th 34 c.cm. of the separated serum were injected intramuscularly. On the same day blood was obtained from Nurse S., a patient in an adjoining ward, who was in her fourth week of convalescence from simple scarlatina. 33 c.cm. of the separated serum were given intramuscularly on the afternoon of the 9th. The results are evident on the chart.

This case brings out the point which you mention—termination by crisis. Beyond serum rash and sickness, which appeared on the 18th, convalescence was uninterrupted.

I am, Sir, yours faithfully,

Glasgow, Dec. 9th, 1921. C. CAMERON.

THE CARELLI METHOD OF PERIRENAL INFLATION.

To the Editor of THE LANCET.

SIR,—With regard to Dr. Carelli's visit to London, referred to in your annotation of Dec. 17th on Gas Inflation of the Peritoneum in Radiography, I think it right to say that we owe his coming to Dr. F. G. Crookshank, physician to the French Hospital. Dr. Crookshank attended a demonstration by Dr. Carelli at Delherm's Clinic in Paris, and persuaded him to come to London. Dr. Carelli not only described his methods and skiagrams at the Royal Society of Medicine, but gave a demonstration of his procedure upon the living subject in the X ray department at the French Hospital with his own inflation outfit. This is a simple apparatus, easy to duplicate. Apart from this, only the ordinary resources of the department were employed, and two excellent radiographs were obtained. Oxygen was used, not CO_2, as the latter was not available. This proved rather an advantage under the circumstances, as I was able to repeat the exposures more than an hour later in my own rooms. All the plates—which were exhibited at the Royal Society of Medicine—showed the adrenal body, and in some the vessels could also be seen.

That the patient suffered but little discomfort, and was able to move freely a few minutes after the inflation, can be testified to by several medical men who were present.

I am, Sir, yours faithfully,

F. HERNAMAN-JOHNSON, M.D.,
Director, X Ray and Elect. Service,
London, W., Dec. 17th, 1921. the French Hospital.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

An Irish Session.

PARLIAMENT reassembled on Wednesday, Dec. 14th, for a special session to consider the articles of agreement entered into between the British Cabinet and the Irish delegation of plenipotentiaries with regard to the future government of Southern Ireland as an Irish Free State. The session was opened by His Majesty in State, and the gracious speech from the Throne was exclusively confined to the Irish agreement. After debates in both Houses, which lasted three days, the agreement was ratified in the House of Lords by 166 votes to 47 and in the House of Commons by 401 votes to 58.

The session was prorogued on Monday, Dec. 19th, to Tuesday, Jan. 31st.

HOUSE OF COMMONS.

FRIDAY, DEC. 16TH.

Importation of Menthol.

Mr. NEWBOULD asked the President of the Board of Trade if he was satisfied that the procedure of his department in placing substances, such as menthol, amongst the commodities which were liable as fine chemicals to a duty of 33⅓ per cent., and afterwards attaching the letter R to the names of these substances, thereby exempting them from duty, was not calculated to create considerable confusion; and was he prepared to give an undertaking that no such action would be repeated without public inquiry, of which notices had been previously circulated in the public press, instead of in a weekly journal published by the Board of Trade, of whose existence few traders were aware.—Mr. STANLEY BALDWIN replied: Certain amendments have been made to the lists as originally issued under the Safeguarding of Industries Act, but all the amendments so far made restrict the scope of the original lists. It is obvious that in lists such as those in question it must be necessary to make some corrections, and I see no reason to modify the procedure adopted. I should add that I do not accept the statement at the end of the question as being correct.

Dr. MURRAY asked the President of the Board of Trade where his department obtained the menthol which they stated was purer than the ordinary imported menthol and which was the basis of the addition of the letter R in the Board of Trade list which defined the Key Industries Schedule; whether this menthol so obtained was a commercial article before objection was lodged to the inclusion of menthol in the list; and whether, in fact, it was a commercial article at all.—Mr. STANLEY BALDWIN replied: A re-crystallised menthol of substantially better quality than the Japanese menthol ordinarily imported has been prepared in Germany by a well-known firm and was listed as "Menthol pure in crystals" in their English catalogue as long ago as 1911. I am informed that during recent years at least one English firm has been re-crystallising menthol and selling small quantities.

Importation of Santonin, &c.

Dr. MURRAY asked the President of the Board of Trade whether, in view of the decision given by the Lord Chancellor's referee on Dec. 10th in respect of santonin and of the grounds given for that decision which affected by implication a large number of commodities contained in the list published by the Board of Trade under the Key Industries Schedule of the Safeguarding of Industries Act, he would be prepared to extend beyond Jan. 7th, 1922, the date up to which objections to the list might be lodged, at any rate until he had officially announced the scope of the action which he intended to take as a result of the decision given, especially as regards all those natural substances which were so closely related to santonin as to be governed by exactly the same principles—e.g., salicin, menthol, mannite, lactose, eserine, &c.—Mr. STANLEY BALDWIN replied: No, Sir. I am not prepared at present to undertake to extend the period during which complaints may be lodged which the Board must refer to the referee; but should the principles on which the decision mentioned was based be maintained the list will of course be revised accordingly, and I shall be prepared to consider at any time any representations which may be made to me in that regard.

Indian Opium Statistics.

Mr. GILBERT asked the Secretary for India what was the acreage in India now under cultivation with the opium poppy; how many chests of Indian opium were now exported annually; what were the destinations of this exported opium; and whether any and, if any, how much was converted into prepared opium for smoking.—Colonel GIBBS (Treasurer of the Household) replied: The total area under poppy cultivation in British India amounted to 156,435 acres in the year 1919–20. 9823 chests of opium were exported in that year. The countries which imported this opium were the Straits Settlements, Dutch East Indies, Siam, French Indo-China, Japan, United Kingdom, Hong-Kong, British North Borneo, Ceylon, Mauritius, and the Fiji Islands. I am not in a position to state how much of the raw opium exported from India to other countries is there converted into prepared opium for smoking.—Mr. BARNES: Can the hon. and gallant gentleman say if the Government are working in full harmony with the organisation under the League of Nations for the reduction or suppression of this trade?—Colonel GIBBS: I am not in a position to state that myself, but I will tell my right hon. friend what the right hon. gentleman says.—Mr. BARNES: Will the hon. and gallant gentleman make inquiries on the matter?—Colonel GIBBS: Yes, Sir.

Medical Stores for Russia.

Mr. ANEURIN WILLIAMS asked the Prime Minister whether His Majesty's Government was aware that the number of starving people in the Russian famine area was far beyond the reach of private charity; and whether the Government had decided to recommend the granting of credits to the Russian Government for the purpose of food without which millions of people must starve during this winter.—Mr. CHAMBERLAIN (Lord Privy Seal) replied: The Government are fully alive to the serious nature of the famine in Russia. The answer to the second part of the question is in the negative; the hon. Member is no doubt aware that Parliament has voted a sum of £100,000, representing the present value of Government stores, chiefly medical, to be placed at the disposal of the Red Cross Society for the relief of famine in Russia. The original value of these stores was £250,000; their present day value is £100,000.—Replying to further questions by Mr. WILLIAMS, Viscount CURZON, and Sir C. YATE, Mr. CHAMBERLAIN said: The sum which has been voted by the House was voted to send stores, mainly medical stores, which were to be at the disposal of the Red Cross for use in Russia. I am not aware of any proposal as suggested that with other powers we should collectively vote money from national funds, but it is quite obvious that in dealing with any matters of this kind we must have regard at the present moment to the condition of our own people.

Treatment Allowances.

Mr. JOHN DAVISON asked the Minister of Pensions whether he would inform the House how many men had been struck off treatment allowances in consequence of the circular of the Ministry dealing with the supervision of out-patient treatment; how many of those struck off allowances were certified by the Ministry of Pensions fit for any work; how many were ordered to continue treatment without allowances;

and whether, in view of the posters issued by the Minister of Pensions in 1919 intimating to disabled men that during treatment, while unable to earn, they would be given adequate allowances for the support of themselves and their families, this practice would be reconsidered?—Mr. MACPHERSON replied: I regret that the figures for which my hon. friend asks are not available. I would, however, point out that it is not the duty of the medical officers of the Ministry to certify men as fit for work, and that treatment allowances can only be authorised under the terms of the Royal Warrant when, in consequence of the treatment provided, the man is rendered unable to provide for his own support and that of his family. This is not a new principle and I am not prepared to recommend any amendment of the Warrant in this respect.

MONDAY, DEC. 19TH.

Parcels of Anæsthetics Held Up.

Dr. MURRAY asked the Chancellor of the Exchequer whether he could say why it happened that three parcels of beta-eucaine arrived from Germany on the ss. *Oranje Nassau* on Nov. 4th and that the importers of these parcels were not advised of their arrival until Nov. 21st; why, when they paid on Nov. 22nd the duty demanded by His Majesty's Customs under the Safeguarding of Industries Act, they were still unable to obtain delivery of the parcels; whether he was aware that daily application were made to the Customs parcels post department at Mount Pleasant, who were informed that the material contained in the parcels consisted of important local anæsthetics used in surgical operations and was urgently required by hospitals; why delivery was not obtained from His Majesty's Customs until Dec. 8th; and whether he proposed to take steps to obviate the continuance of such delays.—Mr. HILTON YOUNG replied: The parcels in question reached the Customs on Nov. 15th and the notice on arrival was sent to the addressees on the 18th. Duty was paid on the 22nd, but it is regretted that owing to the transfer of this parcel post work to more commodious premises which was then proceeding, a delay occurred which was unavoidable in the circumstances. This cause of delay will not recur, and the transfer will benefit importers by reason of the possibility of accelerating delivery which it will afford.

Importation of Chemicals.

Dr. MURRAY asked the Chancellor of the Exchequer whether he was aware that, owing to the absence of technical knowledge of chemicals on the part of the Customs officials ordinarily concerned with the examination of goods arriving at the various ports throughout the country, it had become the practice of His Majesty's Customs to detain all parcels of chemicals and to refuse delivery to importers on the ground that inquiries were being made; that the consequent delay, even in the case of goods not dutiable, frequently amounted to weeks; and that it had become the practice of His Majesty's Customs to ignore any interim complaints which might be made by traders as to the great inconvenience that they were put to by the consequent hold-up of business; and whether he could devise some means whereby a decision might be given on the spot in any cases of this kind which involved only an ordinary working technical knowledge of the commodities in question.—Mr. HILTON YOUNG (Financial Secretary to the Treasury) replied: In the case of chemicals entered as not liable to duty, as to which the examining Customs officer is in doubt whether duty is not chargeable under Part I. of the Safeguarding of Industries Act, it is necessary to submit a sample for expert opinion by the Government chemist, and this opinion is obtained with the least possible delay. But if the importer wishes to obtain immediate possession of the goods it is always open to him to do so on deposit of an amount sufficient to cover the duty in the event of the goods being ultimately held to be liable. As decisions are given on various substances the officers at the ports will become more experienced in deciding liability without the necessity of submitting samples, and the inconvenience complained of will diminish. I am not, however, prepared to incur the expense attendant on the appointment of expert advisers at the various ports.

UNIVERSITY OF PARIS: POST-GRADUATE COURSE IN OPHTHALMOLOGY.—Prof. F. de Lapersonne, with the assistance of Prof. F. Terrien and Drs. A. Hautant, E. Velter, P. Prelat, and Monbrun, will hold a post-graduate course in ophthalmology beginning on May 23rd, 1922. The course will include clinical teaching and practical instruction in operative and laboratory work. Lectures and practical work will be held daily in May and June, and a special certificate from the Faculty of Medicine of the University of Paris will be given to medical men who have completed the course. Medical men and students who wish to attend are asked to write to the Secretary of the Faculty of Medicine. The number admitted will be limited to 50 and the fee is Fr.150.

Medical News.

UNIVERSITY OF CAMBRIDGE.—The following degrees have been conferred:—

M.D.—B. K. T. Collins, Trinity; and J. C. Matthews, Downing.

M.B. and B.Ch.—C. H. Whittle, Queens'; W. H. Blackburn, Christ's; C. Suffern and G. D. C. Tracy, Emmanuel; and L. Cunningham, Downing.

M.B.—P. D. H. Chapman and H. A. A. Pargeter, Sidney; and N. D. Dunscombe and J. Whittingdale, Downing.

B.Ch.—G. H. Ward, Caius.

The following candidates have passed both parts of the examination in Psychological Medicine and are entitled to receive the diploma: M. A. Archdale, S. Kelly, G. A. Lilly, R. A. Noble, and W. D. Wilkins.

UNIVERSITY OF LIVERPOOL.—At examinations held recently the following candidates were successful:—

DEGREES OF M.B. AND CH.B. (HONOURS).

Class I.—J. L. Armour (distinction in Surgery and Obstetrics) and C. A. Wells (distinction in Medicine and Surgery).

Class II.—C. H. R. Carmichael (distinction in Surgery) and E. N. Chamberlain (distinction in Medicine).

FINAL EXAMINATION FOR DEGREES OF M.B. AND CH.B.

Part III.—O. A. Akjaly, J. R. Bhatia, H. R. Chibber, A. C. Crawford, Helen M. Duvall, I. S. Fox, R. A. Galway, F. G. Latham, J. F. C. McColl, Kathleen M. Platt, Gladys Rutherford, F. C. H. Sergeant, N. S. Taylor, and W. T. de V. Thomson.

Part II.—W. H. A. Dodd, G. T. Krajewski, C. B. Lewis, G. F. G. Prideaux, G. Sanders, E. R. Smith, Enid F. Stowell, A. Weisberg, and D. A. Woodeson.

Part I.—A. R. D. Adams, J. Berkson, R. W. Brookfield, T. L. Bulmer, I. Casdan, W. J. B. Chidlow, R. G. Cooke, R. L. Corlett, I. H. Davies, Hilda M. Davis, F. Earlam, F. S. Fowweather, Susan Gluck, H. Graf, J. R. Griffiths, A. J. Hawe, C. W. Healey, S. Hesselberg, Elizabeth Hunt, L. E. Johnson, F. H. Jones, A. Kefalas, T. J. Kirkpatrick, D. A. Levin, Eileen M. Lloyd, Marion R. Lunt, D. Macfarlane, Mary M. McMillan, P. Madan, P. Malpas, C. H. Owen, Eleanor M. P. Pearson, J. D. O'M. Poole, E. L. Roberts, J. Roberts (with distinction), Dorothea W. Rogers, J. A. Scott, J. F. D. Shrewsbury, E. R. Smith, J. R. A. Tallack, Dorothy A. Taylor, Elizabeth M. Theron, V. T. Thierens, H. A. Thomas, R. W. Thomas, A. Tumarkin (with distinction), E. J. Whymark, H. P. Widdup, A. G. Wilkinson, E. B. Wilkinson, and J. Williams.

DIPLOMA IN TROPICAL MEDICINE.

G. P. F. Allen (recommended for the Alan H. Milne Memorial Medal), C. R. Corfield, A. Hamid, B. W. Longhurst, G. A. Macvea, H. R. Madan, W. P. Mulligan, and S. S. Shri Kent.

UNIVERSITY OF DUBLIN, SCHOOL OF PHYSIC, TRINITY COLLEGE.—At examinations held recently the following candidates were successful:—

FINAL MEDICAL EXAMINATION.

Part I., Materia Medica and Therapeutics; Medical Jurisprudence and Hygiene; Bacteriology and Pathology.—Bernard Gluck, Francis J. O'Meara, Victor O. McCormick, Joseph A. Gaynor, and Marjorie F. Sibthorpe (all of whom passed on high marks), Benjamin W. D. Fayle, John E. McCormick, Norman E. H. P. Williams, Florine Isabel Irwin, Henry O'Donnell Burke-Gaffney, Reuben Lipschitz, Percy Samolsky, Ely G. Copeland, Johannes H. Stals, Wilfrid E. C. Wynne, Eileen Agnes Boyd, Maurice Schwartzberg, Henry M. Martin, Thomas G. Wilson, William E. Callanan, Anne D. Dockrell, Edward Harvey, Jan Hendrik Hodgman, Raymond J. G. Hyde, Lionel S. Levitt, Siegfried D. Gabbe, Asher Asherson, Robert S. McElroy, Robert L. C. Fisher, Bertha H. Lawler, Norah M. Gilcriest, and Julius Kruger.

Pathology only.—Joseph Harte and Jacobus F. van Staden.

Materia Medica and Therapeutics; Medical Jurisprudence and Hygiene.—David J. Malan, Henry C. Joly, William L. Duncan, and James J. Fitzgerald.

Medical Jurisprudence and Hygiene; Bacteriology and Pathology.—Eric C. Downer.

Part II., Medicine.—Gilbert M. Irvine, Charles Theodore de Mornet Villet, Ninian McIntire Falkiner, William A. Murphy, Cyril J. U. Murphy, Cornelis Derksen Dijkman, Minnie Alper, Joseph C. Gillespie, Theunis de Bruijn, John Lait, Francis Malone-Barrett, Albert S. Bradlaw, John R. Craig, Robert Dormer, Abraham Agranat, Vera G. M. Menary, Max W. Kaplan, Robert N. Perrott, Petrus H. S. Fouche, Margery Bouchier-Hayes, Max Elion, Gilbert Kirker, Robert A. O'Meara, and John D. Watson.

Midwifery.—Seymour G. Rainsford and Abraham Agranat (passed on high marks), Samuel G. Weldon, Petrus H. S. Fouche, Leon O. Vercueil, Hendrik Nicolas Krige, Izidore P. Myers, John C. J. McEntee, John V. Carroll, Ruth Lemon, Albert E. Phillips, Charles E. Brunton, Izak F. A. de Villiers, Leopold Stazunsky, Charlotte A. Stuart, Maurice Bewley, May E. Powell, Max W. Kaplan, James J. P. Kelly, Charles E. Ovendale, Gideon C. Malherbe, Richard Lang, Victor Robinson, George Blackall, Ruth F. Flavelle, Jacob Hofman Minnie Alper, Dorothy A. Daly, John H. J. Stuart, Olive V

Fair, Laurence Phillips, Michael G. J. Powell, Richard Seale, Allen E. Drotske, Donald H. Saayman, Harry C. Dundon, Robert E. Fausset, Gilbert Kirker, Max Sayers, Rupert L. Hill, Henry L. Hanna, George S. Moran, James V. Williams, Robert R. Baker, and James R. Wills.

Surgery.—Gilbert M. Irvine and Theunis de Bruijn (passed on high marks), Cornelis Derksen Dijkman, Daniel Hugo, Izak G. Sacks, Doris Holland, Leopold Stazunsky, Thomas G. Warham, William A. Murphy, Richard Seale, Charles Theodore de Mornet Villet, Ivan Marais, Leon O. Vercueil, Abraham Agranat, Max Elion, Donald H. Saayman, Cecil de Lisle Shortt, John D. Thompson, Alfred H. N. Todd, Charles E. Ovendale, William B. Briggs, Jacob Hofman, Herbert Hall, George C. B. Robinson, Beryl Frances E. Cockle, Rita Dillon-Leetch, Max W. Kaplan, and Richard Lang.

DIPLOMA IN PUBLIC HEALTH.

Part I.—Richard W. Power, Edward G. Campbell, and William L. Young.

Part II.—Frederick W. Godbey, William B. J. Pemberton, Alan G. Wright, Jessie O. Gilbert, and Charles L. McDonogh.

UNIVERSITY OF EDINBURGH.—At the graduation ceremonial held on Dec. 16th the following degrees were conferred :—

DOCTOR OF MEDICINE.

Garth Ap Thomas, John J. Rouse Binnie, Alice Bloomfield, *Cecil C. Brown, Samuel B. B. Campbell, †Vincent T. Carruthers (in absentia), *Alexander G. Coullie (in absentia), *Francis A. E. Crew, *Herbert R. B. Gibson (in absentia), *Robert L. Girdwood (in absentia), George H. Gunn, Gustav Lange (in absentia), David Lennox, John S. Lloyd, *Benzion Morrison, Hubert Patley, Ella F. Pringle, Richard H. Pulipaka, Andrew O. Ross, Joseph H. M. Sandison, Herbert J. Slane (in absentia), and Arthur K. Towers.

* Commended for thesis. † Highly commended for thesis.

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY.

Reuben Abramsky, John C. Adam, Cecil S. Appleyard, Elias Arosemena, Charles G. Auld, Charles T. B. Benson, Lionel R. Bergson, Susan A. Binnie, John M. Blair, Roger P. Bliss, John M. Bonar, G. Brewster, Agnes G. Brough, Douglas L. Brown, Charles Brownlee, William S. Burr, Karl F. Caird (second-class honours), Arthur Campbell, Donald Campbell, George G. Campbell, Charles G. Catto, Clarence Henri-François de Chalus, Edwin Clark, Donald R. Clarke, Matilda L. Craig, Douglas R. Cramb (second-class honours), John C. Cruickshank, Alexander H. Deighton, John A. Douglas, Alexander MacGregor Duff, Jeannie P. Dunn, Katrine Dunn, Evelyn B. G. Ewen, Gordon B. Flint, Charlotte E. Forsyth, John A. Fraser, Eileen R. Freeman, Frederic L. A. Gacé, Marjorie Geen, Owen S. Gibbs (second-class honours), Norris Giblin, Doris M. Gibson, Helen E. Gibson, Andrew R. Gilchrist, Ion S. Hall, Thomas Harrison, Isabella M. Hay, William B. E. Hughes, Elspeth J. Hunter, Richard H. R. Innes, Barnett Isaacson, Inez M. Y. M. Jenkins, Charles I. I. Jones, Joseph O. Kelly (first-class honours), Marjorie C. Kerr, Arthur King, Johan Lovius, Patrick J. McDiarmid, Jane W. Macdonald, William S. Macdonald, George S. Mackay, George W. J. Mackay, John C. MacKay, Henry D. McKinna, Herbert McNair, John W. Mason, Donald S. Middleton (second-class honours), Ian C. Middleton, Ann L. Morrison, Quazi Mahammed Musa, Stanley S. Nicholson, George Ogilvie, Montague M. Ostrowick, James W. T. Patterson, Harry R. Potter, Alexander M. W. Rae (second-class honours), Louis Ratnayaké, William B. Reid (second-class honours), Charles A. Robson, Abraham Sanders, Ernest L. Sanders, Gerald G. Sanders, Margaret M. Sands, Manmatha Nath Sanyal (in absentia), Gordon S. Scott (second-class honours), Charles M. Seward, John McDonald S. Slater, Allen T. Sloan, Thomas R. C. Spence, George D. Steven (second-class honours), Francis M. Stewart, Alexander Stuart, Alister Sutherland, Arumana Krishnan Tampi, Marion C. Taylor, Lewis Teitelman, David W. C. Tough, George A. Velluot, Kakumanu Vullakki, George B. Walker, John Walker, Peter K. Walker, Sarah B. H. Walker, Kenneth B. Williamson (second-class honours), Arthur J. Wilson (second-class honours), John T. Wilson, and John H. Wright.

DIPLOMA IN PUBLIC HEALTH.

William P. S. Johnson.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College held on Dec. 16th the following candidates, having passed the requisite examinations, were admitted Fellows :—

Ennis R. Chambers, Cecil B. Clarke, Jacob H. Dove, Ernald D. Smith, Vinayak Balvant Gokhale, John W. Hall, Norman Hodgson, Ernest W. Ingle, Merwan Sorab Irani, Venkatras Manjunath Kaikini, Robert Mailer, Robert B. P. Monson, Kali Sahai Nigam, Arthur L. Sheppard, Phineas A. Smuts, David Steven, Robert L. Stewart, and Thomas J. R. Warren.

Dr. George Mackay and Mr. Charles W. Cathcart, C.B.E., were re-elected representatives on the Board of Management of the Royal Infirmary, Edinburgh for the ensuing year.

ROYAL INSTITUTION.—The first of the Christmas Course of Juvenile Lectures at the Royal Institution on Electric Waves and Wireless Telephony, by Prof. J. A. Fleming, will be delivered next Thursday (Dec. 29th) at 3 P.M. on Surface Waves on Liquids. The succeeding lectures will deal with Waves in Air, the Telephone, Electric Oscillations, Electric Waves, and Wireless Telephony.

UNIVERSITY OF LONDON.—A meeting of the Senate was held on Dec. 13th, Sir Sydney Russell-Wells, the Vice-Chancellor, being in the chair. Mr. R. H. Aders Plimmer, D.Sc. Lond., was appointed as from Jan. 1st, 1922, to the University Chair of Chemistry tenable at St. Thomas's Hospital Medical School. Dr. Plimmer was educated at University College, London, and at the Universities of Geneva and Berlin. From 1902 to 1904 he was Grocers' Company's Research student at the Lister Institute of Preventive Medicine, and in the latter year was appointed assistant for physiological chemistry at University College, where he was later elected to a Fellowship and appointed to teach chemistry to medical students. In 1912 the Senate conferred on him a readership in physiological chemistry. Since 1919 he has been head of the biochemical department of the Rowett Research Institute of Animal Nutrition and North of Scotland College of Agriculture, and research lecturer in applied biochemistry in the University of Aberdeen. He is co-editor with Prof. F. G. Hopkins of "Monographs on Biochemistry," and is the author of numerous publications on chemical and physiological subjects.

The Royal Dental Hospital and London School of Dental Surgery was continued as a School of the University in the Faculty of Medicine (in dentistry only) for a further period of three years. Regulations for the new degree of Bachelor of Dental Surgery were approved for internal students.

Sir Sydney Russell-Wells was reappointed the representative of the University on the General Medical Council for 1922–23, and Prof. A. D. Waller, F.R.S., was appointed to represent the University at the unveiling of a memorial to Pasteur, in commemoration of the 100th anniversary of his birth, to take place at Strasbourg.

HONOUR TO A MEDICAL MAN.—The medal of the "Reconnaissance Française" has been bestowed upon Dr. Alfred S. Gubb, of Algiers, by the President of the French Republic in recognition of his devoted services in the work of the French Red Cross.

LECTURES ON HOSPITAL ADMINISTRATION.—A three months' course of lectures and demonstrations on hospital administration will be given at the North-Western Hospital, Lawn-road, Hampstead, London, N.W., by Dr. E. W. Goodall, on Mondays and Thursdays at 5.15 P.M., beginning on Monday, Jan. 9th, 1922. Medical men desiring to attend the course of instruction are required before attending at the hospital to pay the fee of £3 3*s.* to the Clerk to the Metropolitan Asylums Board, Embankment, London, E.C. 4, giving their full name and address.

POPLAR HOSPITAL FOR ACCIDENTS.—The annual festival of this hospital was held at the Holborn Restaurant on Dec. 13th. Sir Joseph Broodbank said that whereas before the war the annual cost of the hospital was about £11,000, to-day it was £20,000. During the last seven or eight years they had saved three-quarters of the £50,000 required for new buildings. Working men themselves gave £1700 per annum direct to the funds, in addition to the 2*s.* 6*d.* per day which now had to be charged to in-patients. Every year 50,000 people passed through the hospital, and so frequent were accidents in dockland that 160 cases were treated daily. Viscount Knutsford congratulated the management upon possessing the only hospital in London that was in a prosperous condition.

LONDON PANEL COMMITTEE DINNER.—The second annual dinner organised by the Local Medical and Panel Committee of London and held at the Holborn Restaurant on Dec. 15th, was followed by a dance and was altogether a pleasant social affair. Two of the invited guests occupied important positions at the Ministry of Health—viz., Mr. R. W. Harris, and Dr. J. Smith Whitaker, while the third, Sir Thomas Neill, was the newly-elected chairman of the London Insurance Committee. Dr. H. J. Cardale, who presided, and Dr. Lauriston Shaw, who replied to the toast of "The Committee," also spoke, the message of all five speakers being summed up in the sentence: "The eyes of the world are turned on London as an object-lesson in the success or failure of the insurance principle in medical practice." Sir Thomas Neill, who spoke with warmth, said that the worse the neighbourhood and the more fragile the community, the higher the class of medical man required there. Dr. Smith Whitaker gave an instructive historical survey of the development of contract practice. He was himself instrumental in 1895 in organising a local medical society in Great Yarmouth, which insisted on three essential points in club practice: free choice on the part of doctor and patient, representation of the medical profession in the management, and a medical committee elected by the practitioners doing the work, to be consulted on conditions of employment. These three principles were, he said, first accepted by the British Medical Association and were then incorporated in the Insurance Act of 1911.

MEDICO-LEGAL SOCIETY: ANNUAL DINNER.—The annual dinner was held on Dec. 14th at the Holborn Restaurant, London, Mr. Justice Atkin presiding. Among the invited guests were the Lord Chief Justice, the Attorney-General, Sir William Willcox, Mr. James Berry, and Sir William Collins. The last-named, in proposing the toast of Medicine and the Law, expressed his belief that the voluntary system of hospital management would outlast any form of State control.

THE LATE DR. W. KEITH WELSH.—The death occurred on Dec. 11th at the age of 72, at Waterlooville, where he had lived since his retirement, of W. Keith Welsh, L.R.C.P. Edin., who practised for about 40 years in Portsmouth. He was for nearly the whole of that period one of the parish medical officers, and his conscientious work and kindly manner made him very popular amongst members of friendly societies in the town; and he was esteemed by his colleagues as well as by a wide circle of friends and will be greatly missed.

ERADICATION OF VERMINOUS CONDITIONS IN LONDON.—In its new General Powers Bill, which is to be submitted to Parliament in the session of 1922, the London County Council will seek additional powers for dealing with filthy and verminous articles and premises. The intention is to render more effective the powers already possessed by borough councils under the General Powers Act of 1904. Difficulty has been experienced in administering the 1904 Act, under which a sanitary authority cannot deal with verminous articles or premises unless a borough medical officer can certify that he has actually seen vermin therein. Under the Bill it will be possible for a sanitary authority to deal with such articles upon a report from a medical officer that they had been used by a verminous person. The work of cleansing or destruction will be carried out at the expense of the sanitary authority, and provision is made requiring the sanitary authority to compensate an owner who suffers unnecessary damage by reason of the exercise of the powers of the section, and also to compensate him for articles destroyed. A definition of vermin is included, and improved powers of entry are sought. The Council believes it will be more convenient to repeal all the provisions dealing with the subject in the Act of 1904 than to modify them, and the Bill will therfore contain new provisions.

THE LATE DR. THOMAS ALGERNON CHAPMAN, F.R.S.—On Dec. 17th Dr. T. A. Chapman died at Reigate, where he had lived in retirement, at the age of 79. He qualified M.D. Glasgow with honours in 1863, becoming L.R.C.S. Edin. in the same year. He held the posts of resident physician and surgeon at the Glasgow Royal Infirmary and later became interested in mental diseases. This interest led to his appointment as assistant medical officer to the Joint Counties Hospital at Abergavenny, and eventually he became medical superintendent of the County and City Asylum at Hereford. But Dr. Chapman's real interest and the source of his fame was the study of entomology. He was a distinguished Fellow of the Entomological and of the Zoological Societies, and in 1918 obtained the Fellowship of the Royal Society for his scientific work. His publications include a book on the genus *Acronycta* and its allies and many contributions to the Royal Society, the most recent of which, presented last session, include papers on an undescribed Lycænid butterfly from Cyprus and on the full grown larva of an allied species. The number of medical men who find sufficient leisure to become distinguished in other spheres is rare, and the death of Dr. Chapman removes a useful link between medicine and its sister sciences.

CORRIGENDUM.—In the subscription list to the Wood-Hill Fund, appearing in our issue of Dec. 17th, p. 1299, Mr. G. Grey Turner, Mr. H. A. T. Fairbank, Mr. E. H. Bruce-Fox, Mr. William Wyllys, and Sir Hugh M. Rigby should have been shown as donors of ten guineas each. We regret the error.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

WEDNESDAY, Dec. 28th.—10 A.M., Mr. MacDonald: Genito-Urinary Department.
THURSDAY.—2 P.M., Mr. Donald Armour: Operations.
FRIDAY.—2 P.M., Mr. Sinclair: Surgical Out-patients.
SATURDAY.—10 A.M., Dr. Arthur Saunders: Medical Diseases of Children.
Daily:—10 A.M., Visit of Post-graduates to Wards. 2 P.M., In-patient, Out-patient Clinics and Operations.

Vacancies.

For further information refer to the advertisement columns.

Bath, Winsley Sanatorium.—Asst. Res. M.O. £250.
Birmingham General Hospital.—Res. M.O. £155. H.P. and H.S.
Birmingham, Rubery Hill and Hollymoor Mental Hospital.—Jun. Asst. M.O. £400.
Birmingham University.—Prof. of Anatomy. £1000.
Blackburn County Borough.—Asst. M.O.H. £600.
Bolton County Borough.—Asst. M.O.H. and School M.O. £400.
Bristol, Ministry of Pensions Hospital.—Jun. M.O. £350.
Bury Infirmary.—Jun. H.S. £150.
Cambridge, Addenbrooke's Hospital.—H.S. £130.
Canterbury, Kent and Canterbury Hospital.—Hon. Ophth. S. Also Res. M.O. £175.
Cape Town University.—Tech. Asst. in Surgery. £350. Sen. Lect. in Physics. £450.
Central London Throat and Ear Hospital, Gray's Inn-road.—Fifth Asst. S.
Chester, Cheshire County Council.—Dist. Tub. O. £600.
Colchester, Severalls Mental Hospital.—Asst. M.O. £7 7*s.* weekly.
Derbyshire County Council.—Sanat. Supt. £700.
Doncaster Royal Infirmary and Dispensary.—Jun. H.S. £200.
Dorchester, Dorset County Council.—Asst. M.O. £500.
Exeter, Royal Devon and Exeter Hospital.—Sen. H.S. £250. Asst. H.S. £150.
Gloucester County Mental Hospital.—Jun. A.M.O. £350.
Hertford County Hospital.—H.S. £200.
Hospital for Sick Children, Great Ormond-street.—Cas. O. £400
Kidderminster Infirmary and Children's Hospital.—H.S. £180.
Leeds Public Dispensary.—Sen. Res. M.O. £250.
Lincoln, Bracebridge Mental Hospital.—Med. Supt. £750.
Lincoln County Hospital.—Jun. H.S. £150.
Lincoln, Lindsey County Council.—Female Asst. M.O. £550.
Macclesfield General Infirmary.—Sen. H.S. £200.
Manchester, Ancoats Hospital.—Radiological Reg. £100. Res. Surg. O. £250.
Manchester Royal Infirmary.—Res. M.O. £200. Asst. M.O. and Second A.M.O. Each £100.
National Hospital for Diseases of Heart, Westmoreland-street.—Res. M.O. £150.
Norwich, Norfolk and Norwich Hospital.—H.S. £200.
Poplar Borough.—M.O. £200.
Putney Hospital.—Hon. Surg.
Royal College of Physicians, Pall Mall.—Milroy Lecturrer.
Royal Naval Medical Service.—Surg. Lieuts.
St. Peter's Hospital, Corent Garden.—Hon. V.D. Officer.
Sheffield Royal Infirmary.—Cas. O. and H.S. £150.
Shrewsbury, Royal Salop Infirmary.—H.S. £275.
Southampton Free Eye Hospital.—H.S. £150.
Southport General Infirmary.—Jun. H.S. £175.
Stoke-on-Trent County Borough.—Asst. Tub. O. £350.

THE Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments: Dorking (Surrey), Winchcomb (Gloucester).

Births, Marriages, and Deaths.

BIRTHS.

COWELL.—On Dec. 10th, at a nursing home, the wife of Lt.-Col. E. M. Cowell, D.S.O., M.D., F.R.C.S. (R.A.M.C., T.A.), of Park-lane, Croydon, of a son.

EDWARDS.—On Dec. 15th, at "Rosetta," Beckenham, Kent, the wife of Major Harry Rumsey Edwards, R.A.M.C., of a son.

MITCHELL.—On Dec. 12th, the wife of E. J. D. Mitchell, M.A., M.B., Weymouth-street, W., of a son.

UNWIN.—On Dec. 15th, at Kingston House, Yeovil, the wife of Harold R. Unwin, F.R.C.S., of a daughter.

MARRIAGES.

WARDROP—SUTTON.—On Dec. 17th, at St. Anne's Church, Highgate, J. G. Wardrop, M.D., Leamington, to Muriel, daughter of A. Sutton, Brookfield-park, N.W.

DEATHS.

CHAPMAN.—On Dec. 17th, at Betula, Reigate, Thomas A. Chapman, M.D., F.R.S.

COX.—On Dec. 13th, at The Limes, Cottenham, near Cambridge, Charles Hayden Cox, L.R.C.P.I., L.M., L.R.C.S.I., aged 65.

ELLIOTT.—On Dec. 19th, after a short illness, at 24, Nicholas-street, Chester, John Elliott, M.D.Lond., F.R.C.P. Lond., in his 61st year.

MASON.—On Dec. 17th, of heart failure, at The Limes, Deal, Alfred Mason, O.B.E., M.C., L.R.C.P., aged 44.

MIDDLETON.—On Dec. 8th, at Dorset-road, Bexhill, William Robert Colvin Middleton, M.A., M.D., C.M., D.P.H., late Medical Officer of Health of Singapore, aged 58.

WALLER.—On Dec. 16th, at Bedford, Walter A. E. Waller, M.R.C.S., L.R.C.P., aged 73.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

THE HEALTH OF INDIA AFTER THE WAR.[1]

DURING the year 1919, although active hostilities with Germany had ceased towards the end of the previous year, various circumstances combined to affect adversely the health statistics of British troops and of the Indian Empire generally. The mass of figures to be dealt with explains the delay in the issue of the Report.

The garrison units, and to some extent the Territorial force, were largely composed during 1919 of elderly men and soldiers who had been found temporarily unfit for active service in Mesopotamia and East Africa; and these were naturally least able to accommodate themselves to the climatic conditions of India. Moreover, the troops arriving from home contained a large proportion of young men under 20 years of age, and in many instances not well suited for tropical service. There was also a general unrest in Northern India, and actual hostilities had to be undertaken along the Afghanistan and North-West Frontiers; large numbers of men had therefore to be retained in the plains during a very trying hot weather, who would, under normal conditions, have been serving in the hills.

The average strength of European troops was 56,561, as compared with 87,982 in 1918, and 69,440 in the pre-war quinquennium, 1910–14. The admissions to hospital were in a ratio of 972·1 per 1000, the deaths 7·74, the invalids sent home 76·40, and the average constantly sick 57·39. These ratios are to be compared with the corresponding ones of 1918, which were 1030·2, 16·19, 22·81, and 60·0 respectively; and with those of the pre-war quinquennium (1910–14), which were 567·2, 4·51, 7·03, and 30·13 per 1000. There was a slight reduction in the admissions and number constantly sick and a great improvement in the mortality compared with the previous year; but the invaliding was more than trebled, and on the whole the conditions were still far removed from the normal for European troops in India. Of the 15 large stations (having over 1000 average strength, and excluding Colaba, where the circumstances are exceptional), Rawal Pindi (with 1360·8 admissions and 85·0 constantly sick per 1000), Delhi, Ferozepore, Lucknow, and Bangalore (790·5 and 53·8), had more sickness than in 1918; but only at Secunderabad and Lucknow were the death-rates (7·03 and 10·12) higher than in the previous year (6·76 and 7·94).

Disease among the Troops.

Influenza, which had been so prevalent and fatal in 1918, died out during the first quarter of 1919, and was generally of a mild type; the admission and death ratios were 25·2 and 0·25, compared with 219·5 and 8·81 in the previous year; at Colaba there were 493 admissions, chiefly in May and June, and 2 deaths (263·2 and 1·07 per 1000); the disease was prevalent in Bombay at the time.

For *malaria* there were 217·8 admissions and 0·74 deaths per 1000, accounting for 22·4 per cent. of the total admissions to hospital and 9·6 per cent. of the total mortality. The admission ratio was less than in 1917 and 1918 (227·9 and 269·2), but much in excess of the quinquennial average (117·2) for 1910–14. The mortality (0·74 per 1000) was also high; in the quinquennium, 1910–14, it had averaged 0·13 per 1000; in the successive years, 1915–18, this ratio had been 0·36, 0·31, 0·48, and 0·65; whether this be due to a real increase in severity of the disease or to increased strictness in diagnosis is doubtful. The list of important stations, having a strength of over 1000 troops, where malaria was prevalent is headed by the new capital of India; at Delhi the actual admissions numbered 615, being in a ratio of 511·6 per 1000; then follow Colaba and Bombay combined (374·3), Rawal Pindi (342·7), Peshawar (333·6), and Lahore (323·4). At Delhi it is stated that "almost every case originated in the Fort. New cantonments and the Kingsway Camp were free from infection. There are no breeding places in the Fort itself, but it harbours innumerable anopheline mosquitos. . . . The chief breeding grounds are in the Civil *Gung* adjacent to the Fort. The civil authorites are gradually (*sic*) proceeding with an extensive anti-mosquito scheme in that area. . . . Prophylactic quinine was issued daily under close supervision and proved [to be] of no avail and rendered laboratory diagnosis more difficult." The qualifying adverb "gradually," as applied to a measure of disease prevention that has been accepted as of paramount necessity for 20 years, appears to be somewhat unsuitable. At Colaba and at Peshawar it is stated that a third of the admissions were relapses; at the latter station "the system of drainage and irrigation in vogue has always been responsible for the high incidence of malaria. The bulk of the water is carried in open earth channels, which are badly graded." At Poona the Bhairoba nullah is the anopheline breeding centre in the station, and until leakage into the nullah from the canal is prevented no marked success can be expected. At 45 hospitals 9604 cases were analysed; of 4151 fresh cases, 66·47 per cent. were of the benign tertian type, 15·68 per cent. malignant tertian, and 0·39 per cent. quartan, the remainder (17·46) being "clinical" cases. Of 5453 relapses the corresponding percentages were 61·36, 8·86, 0·29, and 29·49.

The "*enteric fever group*" caused 257 admissions and 25 deaths, the ratios per 1000 being 4·5 and 0·44 respectively, compared with 7·5 and 0·70 in 1918, and 3·3 and 0·37 in the pre-war quinquennium, 1910–14. Of these total admissions only 56, and of the total deaths only 14, were definitely diagnosed as "typhoid"; paratyphoid A accounting for 74 cases with one death, and paratyphoid B for one case, not fatal; the remaining 126 cases, with 10 deaths, are returned as belonging to the "enteric group." It is unfortunate, and confusing, that this expression is used for the whole group of fevers, which in previous reports had been called *enterica*, as well as, in a restricted sense, for those cases that are not definitely diagnosed as typhoid or paratyphoid A or B. Nothing approaching epidemic prevalence occurred, except at Poona, where, of 47 cases, 40 were among men attached to the military accounts department; men located over a wide area, chiefly under canvas, and in the cantonment area adjacent to the city. The majority took their meals in hotels and restaurants in Poona, the sanitary arrangements in which were difficult to control. No local source of infection was found, and no carriers were detected. At the half-yearly census of European troops, taken on Dec. 31st, 1918, only 1487 (out of 56,561) were found to be not inoculated against enteric. The admissions for dysentery (14·2 per 1000) were more numerous than in recent years; in 1918 they had been 13·8 and in the pre-war quinquennium 6·5 per 1000. Taking dysentery, colitis, and diarrhœa together, the combined admission rate was 55·5, as compared with 24·4 in 1910–14. Of 703 cases of dysentery examined, 596 were reported as amœbic and 95 as bacillary. Venereal disease, which had caused 67·8 admissions per 1000 in 1909, fell to 55·2 in 1914 and 29·1 in 1915; since then the ratio has risen year by year to 87·6 in 1919. This has occurred "in spite of every local effort on the usual lines to check the incidence of the disease." It is attributed to the long time men of the Territorial Army and garrison battalions were necessarily retained in India, "with a resulting loss of moral restraint"; also, defective lighting and want of electric fans in most barracks lead men to seek more attractive resorts in the bazaar, &c. The provision of proper lighting, with fans and anti-mosquito arrangements in barracks, might be regarded as a "local effort to check the incidence of the disease" which was not carried out by the authorities concerned.

Cholera caused only 24 admissions (0·4 per 1000), with 11 deaths (0·19 per 1000); in 1918 the ratios had been 1·0 and 0·42, and in the quinquennium, 1910–14, 0·3 and 0·14 respectively; 9 of the cases occurred at Colaba, where the disease was prevalent in the neighbourhood. There were 416 admissions to hospital for heat-stroke, with 42 deaths (7·4 and 0·74 per 1000), less than in the previous year, but far more than in the quinquennium (1·9 and 0·15 per 1000); this was partly due to retention of men in the plains during a very trying hot weather. There were 139 admissions at Lucknow (100·5 per 1000), of which 96 (with 6 deaths) were from the 3rd Garrison Battalion Bedfordshire Regiment, "a unit which contained a high proportion of elderly men, and had suffered severely from malaria and influenza in Burma. The outbreak occurred as a sequel to the move of the unit from Burma to Lucknow at the hottest time of the year, necessitated by the outbreak of hostilities on the North-West Frontier."

Pulmonary tuberculosis caused 84 admissions and 10 deaths (1·5 and 0·18 per 1000), compared with ratios of 1·8 and 0·22 in 1918, and 1·1 and 0·16 in 1910–14. For small-pox there were 173 admissions (3·1 per 1000), with 19 deaths (0·34 per 1000); in 1918 these ratios had been 1·3 and 0·2 respectively; the cases were sporadic, except at Peshawar, where there were 17, mostly in November and December. It was reported that units arriving from England were in many instances very imperfectly protected. In 15 of the 19 fatal cases it was ascertained that 4 had never been vaccinated, 9 only in infancy, 1 in infancy and re-vaccinated during the incubation period of the disease, and 1 re-vaccinated in 1915, with modified result.

The number of men invalided home was 4324, giving a ratio of 76·40, compared with 22·81 in 1919 and 7·03 in the pre-war quinquennium; the chief causes were heart disease (690), malaria (589), and debility (408). The very high

[1] Report of the Sanitary Commissioner with the Government of India for 1919. Calcutta: Superintendent of Government Printing. July, 1921.

invaliding ratio is ascribed chiefly to (1) the large number of elderly men, due for demobilisation, who were invalided in order to get them home before the onset of the hot weather, especially as ample shipping accommodation was available; and (2) the fact that the battalions arriving in the autumn were found to have a large number of men "suffering from disabilities detrimental to effective service in the tropics"—that is, they had not been adequately examined before leaving England.

Amongst *officers* the admissions to hospital were 1058·8 and the deaths 11·00 per 1000; the corresponding figures for 1918 had been 1344·6 and 15·47, and for the pre-war quinquennium 567·5 and 5·14. The chief diseases causing sickness were malaria (157·0), sandfly fever (69·8), influenza (54·4), and diarrhœa (51·5 per 1000). The admissions and deaths due to enterica were 8·4 and 0·87 among officers, as compared with 4·5 and 0·44 among other ranks. Amongst the *women* the admissions and deaths from all causes were 553·8 and 10·34 per 1000, compared with 603·0 and 24·98 in the previous year, and 504·3 and 7·09 in 1910–14; and amongst *children* 321·6 and 17·45; for whom in 1918 these ratios had been 432·9 and 20·20. The chief causes of illness were debility and malaria in the women, and in the children influenza, malaria, and bronchitis.

The Indian Army.

With regard to the *Indian Army* the Report states that "there has been a satisfactory decrease in the ratio of admissions for all causes as compared with 1918." The ratio was 767·5; this was certainly lower than that of 1918 (856·3), but it was higher than in either of the three previous years (1915–17), and very much above the pre-war quinquennial average (544·6). The continued high ratio was due to influenza (with its resultant debility); return of troops from Mesopotamia, Egypt, and the North-West Frontier; and enlistment of men below the best standard of physical fitness, in order to maintain the strength of troops required. Malaria (145·6), venereal affections (65·1), and respiratory diseases (56·8) were the chief causes of sickness; and pneumonia (2·88), influenza (2·63), respiratory diseases (1·31), and pulmonary tubercle (1·08) the most frequent causes of death; the total mortality being 11·94 per 1000. The large stations showing highest admission and mortality ratios were Bombay (1701·2 and 24·85), and Peshawar (1545·2 and 36·61). There was a very notable reduction in the enteric incidence and mortality (0·40 and 0·06 per 1000), compared with 1918 (0·80 and 0·28) and with the pre-war quinquennium (2·0 and 0·38); nowhere was there any epidemic prevalence. On the other hand, the grouped diseases, dysentery, colitis, and diarrhœa, caused 65·9 admissions per 1000, more than in 1918 (58·4), and nearly double the ratio for 1910–14 (33·5); the mortality was 0·30, compared with 0·45 in 1918 and 0·14 in 1910–14. Cholera was epidemic in the Punjab and affected the troops on active service at Peshawar and in the Khyber; excluding these there were 134 admissions and 77 deaths in the garrison of India (0·60 and 0·34 per 1000). There were no outbreaks of importance except at Kamptee (where 19 cases occurred, traced to contaminated well water), and Agra (21 cases) where a hospital cook spent his spare time at his village nursing a child with cholera. Pneumonia still causes more deaths (661) among Indian troops than any other disease, but was considerably less fatal than in 1918 (2·88 compared with 6·02), though more so than in the quinquennium (1·05). On the other hand, pulmonary tuberculosis caused 249 deaths (1·08 per 1000), compared with 0·65 in 1918 and 0·32 in 1915; for Gurkhas the admissions and deaths were 5·6 and 2·73, and for the rest of the army 3·9 and 0·94 per 1000. Plague caused only 31 admissions and 20 deaths (0·1 and 0·09 per 1000). For relapsing fever there were 141 admissions and 11 deaths, giving ratios of 0·60 and 0·05, as compared with 1·9 and 0·20 in the previous year. In the Report for 1918 attention had been drawn to the fact that Secunderabad did not appear among the ten most malarious stations in India; the fever admission ratio was 141·4 per 1000, compared with 518·4 in the previous year; this was considered to have been the result of drainage work that had been carried out and the substitution of dry for wet cultivation. Although malaria is still the chief cause of admission to hospital in India as a whole, the incidence at this station has declined still further to 56·5 per 1000; this is a striking instance of the true economy that results from expenditure in adopting the necessary preventive measures. At Peshawar, however, there was an increased incidence in spite of vigorous efforts in this direction; the admission ratio was 545·8 per 1000 (compared with 135·2 in 1918). There is a highly infected bazaar population, and the open earth water channels are badly graded. The rainfall was excessive during the malarial season, and there was a lack of mosquito-proof doors and windows in barracks; mosquito nets were provided (but perhaps not used). At 35 hospitals throughout the country attempts were made to distinguish between fresh cases and relapses; out of 11,388 fresh cases, 45·93 per cent. were of the benign tertian type, 18·48 were malignant, 1·83 quartan, 0·53 mixed, and 33·23 "clinical"; among 4082 relapses these percentages were 44·14, 18·0, 0·9, 0·39, and 36·57 respectively. Sandfly fever caused 3081 admissions (13·4 per 1000), with no deaths; all these cases occurred in the Northern Army (except 43), the respective ratios for the Northern and Southern Armies being 23·4 and 0·4; at Peshawar the ratio was 154·5, at Fort Lockhart 200·0, and at Agra 209·9 per 1000. Pyrexia of uncertain origin, for which 34·9 admissions and 0·13 deaths per 1000 had been registered in the quinquennium, 1910–14, has now fallen to 2·3 admissions, with no death; and it is hoped that it will "soon become negligible as a diagnosis in hospital." There were 94 admissions for dengue, 89 of which occurred at Rangoon; in the preceding year there had been 241 admissions, and of these 126 at the same station; no remarks are made as to this obscure, but interesting, disease; there were no deaths. For the enteric group there was a notable reduction both in admissions, which were 101 (0·4 per 1000), and deaths (14, or 0·06 per 1000), the corresponding ratios for 1918 having been 0·8 and 0·28, and for the pre-war quinquennium, 2·0 and 0·38 per 1000. No outbreaks occurred of any importance. On the other hand, for the group of intestinal diseases (dysentery, colitis, and diarrhœa) there were 15,138 admissions (65·9) and 69 deaths (0·30 per 1000), compared with corresponding ratios of 58·4 and 0·45 in 1918, and 33·5 and 0·14 for 1910–14.

A most regrettable feature in the health statistics of the native troops is the enormous increase in *Venereal Diseases* during recent years. In the report of the Sanitary Commissioner for 1899 a table was given of the venereal incidence since 1877, the earliest year for which statistics were available; the admission ratio in that year was 26·7 per 1000; in the decennium 1889–98 it averaged 38·1; in 1897–1906 the average was 30·5; in 1905–14 it was 15·6, having fallen to 12·6 in 1913. Since that year the successive ratios have been 15·6, 34·3, 40·1, 45·0, 53·1, and in 1919, 65·3. The Sanitary Commissioner draws attention to this table as showing "the steady increase in the venereal admission rate which has taken place since the first year of the great war." The epithet "steady" does not appear to be quite the *mot juste* for this (over) 400 per cent. increase on the pre-war prevalence of these affections. Cholera was epidemic in the Punjab during June and July, but did not seriously affect the Indian troops, except those on active service outside India. There were 134 cases and 77 deaths (0·6 and 0·34 per 1000) in the Indian garrison; Agra (21 cases, all in September) and Kamptee (19, all in June) were the stations that suffered most.

Pneumonia, with 12·8 admissions and 2·88 deaths per 1000 (some probably due to influenza) is still the most frequent cause of death in the Indian Army; but shows considerable improvement compared with 1918, when the ratios had been 19·6 and 6·02; in the pre-war period (1910–14) these ratios had been 7·7 and 1·05. Pulmonary tuberculosis, on the other hand, was both more frequent and more fatal than in recent years; the admissions, which for 1915 to 1918 had been in ratios of 2·8, 2·8, 2·9, and 2·5 per 1000, rose to 4·0; and the deaths, which had been 0·32, 0·42, 0·63, and 0·65, rose to 1·08 per 1000. Very high admission rates were recorded at Ahmednagar (18·6) and Benares (12·3). Gurkha troops as usual suffered most, their admission and death ratios being 5·6 and 2·73, compared with 3·9 and 0·94 for the rest of the Native Army.

The weather conditions are summarised in the section dealing with the health of the general population. For the plains of India as a whole the rainfall was 4 in. above the average, the only areas having marked deficiency being the Bay Islands, Assam, Baluchistan, and North Hyderabad.

The Health of the General Population.

Owing to the heavy influenza mortality the birth-rate fell from 37·85 (the quinquennial mean) and 35·35 (in 1918) to 30·24 per 1000; but it is acknowledged that registration is at fault, especially with regard to female births. The death-rate was 35·87, compared with 62·46 in 1918 and 36·84 in the quinquennium, 1914–18; the highest ratios were recorded in Assam (50·09), Central Provinces (43·24), and Delhi (42·00); the lowest in Madras Presidency (27·2), and the Punjab (28·34). The infant mortality varied between 17·6 and 17·7 in the North-West Frontier Province and Punjab and 32·9 in Madras city, 35·8 in Calcutta, and 65·3 in the city of Bombay. Tetanus neonatorum was prevalent in many towns and districts; much is being done, however, in the training of native midwives and the provision of maternity and child welfare centres, as well as in the establishment of coöperative dairies under skilled supervision.

The general population suffered more from cholera, small-pox, and diarrhœal diseases than in the previous year, the death ratios under these three headings being 2·43, 0·57, and 1·22, as compared with 2·35, 0·39, and 1·16 in 1918. The increase in cholera prevailed throughout the country,

the total deaths numbering 578,426; the highest mortality occurred in Assam (5·61 per 1000), and Central Provinces (4·46), the greatest number of deaths (124,949, equalling 2·8 per 1000) in Bengal. Contaminated water is the commonest vehicle of infection, but increasing use is made of potassium permanganate and chloride of lime for disinfecting tanks. Migration of cooly labourers and the assemblage of pilgrims, as at the Ganga Sagar *mela* in January, and at Hardwar, are also factors in causing epidemics. In Bombay Presidency 1919 was the worst year for cholera (with two exceptions, 1900 and 1912) for 20 years; famine conditions and scarcity of drinking water were responsible for this result. Small-pox was epidemic in Bengal, Madras, and the Punjab, the death ratios being 0·8, 1·0, and 0·79 per 1000 respectively; in Coorg there were 529 deaths, giving a ratio of 3·02 per 1000, and in the district of Mercara in this province the mortality was 5·90 per 1000, this being much the highest district ratio throughout India. For plague the death-rate was 0·31 per 1000, compared with 1·85 in 1918; rat destruction, attention to the storage of grain, and inoculation have been carried out systematically. The death-rate from fevers fell from 46·60 in 1918 to 22·93 in 1919, this reduction being largely due to diminution of influenza.

In the *Jails* of India, with an average population of 115,499 in 1919 (compared with 102,348 for the decennium) the constantly sick- and death-rates were 31 and 26·97, compared with 39 and 42·45 in the previous year, the corresponding ratios for the decennium having been 28·0 and 21·25. Attention is drawn to the necessity for "coördination in health administration, not, as at present, a separation into more or less water-tight compartments dealing with hospitals, sanitation, health of prisoners, &c."; what is wanted is some means of "bringing the results of research to the notice of those engaged in the application of methods."

In the section of "General Remarks" some interesting details are given as to the introduction of plague infection by shipping; a committee was appointed to deal with the subject. The conclusion arrived at was that the prevention of access of rats to ships is at present impracticable, and that efficient periodic "deratisation" should be carried out, provided that a suitable gas for fumigation is found, and that the efficient ventilation of the holds is secured. Lieut.-Col. Glen Liston, I.M.S., has devised a machine for the use of hydrocyanic gas, which is now under trial.

This report extends to 346 pages and is fully illustrated by diagrams and tables; the accuracy of the printing is almost perfect. We regret the absence of a map, such as generally provided hitherto, especially as there have been numerous changes in provincial areas and designations within recent years. The first two sections, dealing with the European and Indian armies, are contributed by the Director of Medical Services in India; and the remainder of the volume by Lieut.-Col. F. H. G. Hutchinson, I.M.S., the Sanitary Commissioner.

ACOUSTICON AIDS FOR THE DEAF.

THE electrical hearing aids for the deaf supplied by Acousticons, Ltd., of 18, Hanover-street, W., and manufactured, as we understand, in the United States, are well-made and finished. They consist, as do all electrical aids, of a transmitter and a dry cell attached by a flexible cord to a receiver; the latter may be held to the ear by a lorgnette handle, or fastened to the head by a spring-band. Five types were submitted to us; in the first a single transmitter is rigidly attached to the dry cell and intended to be held in the hand, in the second the transmitter is designed to be worn under a man's tie or a lady's blouse, is provided with a clip and is connected by a cord to the battery which is kept in the pocket or any convenient place. The third type is similar, but has two transmitters fixed rigidly together, and so gives a greater volume of sound; in the fourth type the double transmitter may be used in the same way, or may be fixed into the side of a neat black leather box, which also accommodates the battery, so that it may be used as a table instrument. The fifth type is a table instrument and has four transmitters; it is provided with a switch which disconnects two of the transmitters when desired. All the instruments are fitted with a rheostat to regulate the strength of the current, and with a switch in the receiver to shut off the current when not in use; to conserve the batteries it is most important that this should always be done. The batteries give about 40 hours' service and can then be renewed at the cost of a few shillings. The price of the instruments is naturally high; the first two with a single receiver cost 12 guineas each, the third type costs 14 guineas, and the fourth 16 guineas. We have examined these instruments and tested them on several cases of middle-ear deafness. They give a greatly increased volume of sound—those with multiple transmitters being of course the louder; they are to a considerable extent free from the annoying noises associated with telephonic apparatus; and they have a pleasant timbre with little of the disagreeable "tinny" quality sometimes heard, this being especially the case with the multiple transmitter instruments. The type described here as the fourth, which can be worn on the person or used as a table instrument, is particularly well arranged.

Electrical appliances are of small assistance in cases of nerve-deafness, but are of value in severe deafness due to middle-ear affections; patients with a moderate degree of impairment of hearing are apt to find the adventitious sounds and the quality of the timbre disagreeable, and often prefer some form of resonator. It is much to be hoped that the prejudice against all forms of hearing aid among the general public will soon disappear, for a properly fitted modern appliance is inconspicuous and helps both the patient and his friends.

THE DOCTOR IN COUNTRY LIFE.

To the Editor of THE LANCET.

SIR,—I am writing a book on various aspects of life in the country side, and I wish to include some account of the work of the country doctor, who plays such an important part in our rural life. We all know him as a good friend, often heroic, and kind and generous to our poorer neighbours. I should be very grateful if some of your readers will kindly give me references to books and articles, Government reports, &c., wherein the work of the country practitioner is summarised or explained; and if anybody should be moved to send me any personal experiences or illustrative anecdotes, either about their own work or that of men they have known, I should be greatly obliged. Of course, no names would be published except by permission of the writers.—I am, Sir, yours faithfully,

P. H. DITCHFIELD, M.A., F.S.A.,
Author of "The Parish Clerk," "Old-time Parson," &c.

Barkham Rectory, Wokingham, Dec. 18th, 1921.

THE ASSOCIATION OF CERTIFICATED BLIND MASSEURS.

To the Editor of THE LANCET.

SIR,—Will you allow me to state that it was through the untiring efforts of the late Sir Arthur Pearson, whose tragic death has aroused world-wide sympathy, that blinded soldiers and civilians were trained in the profession of massage, and to suggest that there is no way in which the medical profession can better pay lasting tribute to his memory than by helping those who have received this training to become independent. Our members are established in all parts of London and the provinces, they do not undertake the treatment of patients without the consent and advice of a registered medical practitioner, and their names and addresses can be obtained on application to

THE SECRETARY.

224–6–8, Great Portland-street, London, W. 1.
(Tel.: Langham 2542.)

THE FUTURE OF VETERINARY SCIENCE.

IN a recent address delivered at Exeter, Prof. J. Share-Jones, professor of veterinary anatomy at the University of Liverpool, claimed that the progress of veterinary science in this country had been retarded by the popular idea that its sole concern was the doctoring of sick animals. As chairman of a committee which had been addressed a question from the Government concerning the absorptive capacity of the profession, he was able to state, after inquiry, that in peace-time the Ministry of War could absorb nearly four times as many qualified veterinary sugeons as the Ministry of Agriculture, whilst an adequate public health service would require five times as many.

In 1918 Lord Haldane's Royal Commission on University Education had reported that "the modern veterinary surgeon should proceed through an exacting programme of education, a course of training as specialised and as thorough as that of the student of human medicine." The Commission were of the opinion that the future of veterinary science depended upon its adoption of methods of dealing with disease which had been worked out for human pathology; they also referred to the close association of many human and animal diseases, and the consequent necessity of joint research work.

The Ministry of Health, said Prof. Share-Jones, was the department to have principal charge of veterinary science; it was absurd that rabies should be dealt with by the Ministry of Agriculture, whilst hydrophobia was dealt with by the Ministry of Health. The veterinary profession needed men, in adequate numbers and possessing the highest possible qualifications, in order that the host of unqualified and incapable practitioners might be eliminated; veterinary science would then assume its proper position in medical science and preventive medicine.

AN IMPROVED VARNISH RAT-TRAP.

THE device of catching rats by putting down stiff boards smeared with lithographic varnish, with bait in the centre and foot-hold round the outer edges, originated, we believe, with Dr. W. J. Howarth, M.O.H. for the City of London. Dr. F. W. Alexander, M.O.H. for the borough of Poplar, informs us that one of his inspectors has improved this device by cutting a hole in the centre of the board with foot-hold round the hole and baits at the outer edge. This method of adapting the boards to surround the rat-holes has the advantage that the rats cannot avoid the boards, nor can they do so when, the rat-hole being against a wall, the hole in the board is made at the side instead of in the middle of the board.

BIRMINGHAM NERVE HOSPITAL: ANNUAL REPORT.

THIS is a self-supporting charity. The accounts show a gain of £189 on the year's work and an accumulated surplus of £126. New patients numbered 3104, against 2604 in the previous year, and the attendances were 26,421, against 23,288. The departments of electricity and massage have been specially successful and are to be extended and developed to meet the increasing demands. In moving the adoption of the report the Lord Mayor (Alderman David Davis) said that the hospital had been faced with exceptional difficulties from its inception. These had not yet been removed, and he would have been glad to be able to congratulate the governors upon the fact that the medical profession had offered their gratuitous services as they did to all the other hospitals. They must hope that the time was not far distant when they would receive from the medical profession that recognition to which he thought their work entitled them. During the past year the hospital had had arduous duties to perform, and enormous success had attended their efforts. The time must be rapidly approaching when a different feeling would exist towards new hospitals. If the Nerve Hospital had been doing work similar to that already carried out by other hospitals, then it might be urged that they were overlapping and there was no necessity for their hospital. But they were doing new work and relieving distress and suffering to an extent other hospitals had not yet recognised. He congratulated the governors on their financial position and wished them all success. Mr. Joseph Ansell said that many difficulties had disappeared. The need for such a hospital had been shown again and again, and he was hopeful that at the forthcoming conference any possible difficulties which at present existed between the medical profession and the hospital would disappear. Sir George Bean was elected president for the ensuing year.

THE GOVERNMENT OF INDIA AND INDIGENOUS MEDICINE.

A STATEMENT has been issued by the Government of India defining the position of indigenous medicine in the United Provinces of Agra and Oudh as regards State aid. The Ayurvedic and Unani systems of medicine are still widely popular in this province, and the policy of the Government is to help in the extension to the poor of all kinds of medical relief, including the indigenous systems of medicine; for the encouragement of the latter they included a sum of Rs.25,000 in the current year's budget. The step was in part experimental and the Government have not yet come to a final decision as to the best methods of affording financial assistance. It is believed, however, that the following methods are likely to be most fruitful: (1) To give grants to local bodies to establish travelling or stationary Ayurvedic or Unani dispensaries; (2) to give grants to existing Ayurvedic or Unani dispensaries provided that they are controlled by influential managing committees; and (3) to give grants to existing institutions for the training of Vaids and Hakins subject to the same proviso. The question of the management of Ayurvedic and Unani dispensaries maintained by local bodies is not free from difficulty. The ordinary medical staff of the district will not be available for the purpose, and the Government are of opinion that the supervision will be best exercised through health committees of the local bodies concerned. As regards grants to private institutions, no definite rule can be laid down, but before a grant is made the Government will require proof that the managing committee is influential and that the control exercised is adequate. The grants to local bodies have been allotted in most cases on the principle of giving three-fourths of the amount required for the maintenance of the dispensaries which the local bodies propose to establish, and will not actually be granted unless the local bodies agree to provide one-fourth of the actual annual expenses. In future years the Government will insist on local bodies bearing a more substantial portion of the burden. In addition to Rs.25,000 distributed to various centres a sum of Rs.50,000 has also been sanctioned for the Ayurvedic College established at Hardwar.

CRIMINAL ABORTION.

AT a recent inquest concerning a woman who died of acute general peritonitis consequent upon abortion and septic infection of the womb, Dr. F. J. Waldo, J.P., coroner for the City of London and Borough of Southwark, stated that criminal abortion had become increasingly common since the war. The dread of large families was great among many women, and habitual abortionists abounded. It behoved the police to be on the watch. Conflicting evidence, he added, had been given in the course of that particular inquest, and he trusted that the police would make good use of the clues provided. The jury deemed the evidence insufficient to show how infection was brought about.

THE HOSPITAL STAFF DISPUTE.

THE Metropolitan District Committee of the National Federation of General Workers has recommended all members of trade unions to cease subscribing to London hospitals until these have granted trade-union rates of wages to their staffs. An agreement arrived at by arbitration in July, 1920, between a group of seven hospitals and the Federation fixed the minimum wage of £3, including food, for a week of 48 hours, and it appears that most of these hospitals have given notice to withdraw from the agreement at the end of the present year. Freedom of action is the reason given for this course, and the denunciation of the award does not necessarily imply the intention on the part of hospital authorities either to increase the hours or to diminish the remuneration of their staff. The matter is obviously one for the British Hospitals' Association and the Workers' Federation to decide by collaboration. Whatever basis of charity may still lie at the root of the voluntary hospital system, there can be no intention on the part of any hospital committees, as employers of labour, to deal with their staffs otherwise than they would do in an ordinary commercial undertaking.

CHESS AND PROGNOSIS.

CAPABLANCA'S admirable treatise on "Chess Fundamentals" (London: G. Bell and Sons, Ltd., 1921, pp. 246, 10s. 6d.) will appeal to numbers of medical men and women who find their pastime in chess and who will welcome a companion volume to "My Chess Career." The manual may have a deeper interest to the student of medicine for, in setting out the best way of arriving at an end-result, it helps to throw light on that difficult game of prognosis which resembles in so many particulars a hard-fought game of chess. In medicine as in chess prognosis depends on many factors, some of them under the player's control, some not. Nature and the other fellow are both apt to find out the player's weak points. Capablanca's method of teaching is to take the end-game play when only a few pieces remain on the board, and to show the inevitable or what may be called the classical endings, when, for instance, knight and bishop can only mate the widowed king in one corner of the board just as a chronic renal or heart case may carry on indefinitely until cornered by a final attack of pneumonia or influenza. From simple end-games the strategist works back to the tactics of the middle-game with more pieces on the board and many complicating factors at issue, and leads up to the general theory of direct attack en masse or for the cutting off of particular pieces from the scene of action. The whole is a pretty analysis of a complicated game, which holds the reader as only an expert completely conversant with his subject can do.

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